THE URBAN INSTITUTE

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Project Report

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Final Report on Alternative Methods of Developing a Relative Value Scale of Physicians' Services

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PREFACE

This report presents the results of work completed during the second year of The Urban Institute's project, "Alternative Methods of Developing a Relative Value Scale of Physicians' Services." The first-year's work was concerned primarily with the technical aspects of alternative methods of constructing relative value scales.* Five basic methods were evaluated: charge-based methods, which build relative values from data on physicians' charges; the statistical cost function approach, which would derive relative values from the parameters of a multiproduct cost function for physicians' services; time-based methods, which use data on the amount of time physicians spend performing various procedures; micro-costing and time/motion study methods, which use information obtained by detailed, on-site observation of the process of producing physicians' services; and consensus development/social preference methods, which rely on expert opinion and/or group decision making to arrive at relative values.

If one had to choose only a single method, then the charge-based approach would be the best choice. The construction of a charge-based relative value scale is straightforward. Large, computerized data bases of physicians' charges for procedures identified by their CPT-4 (or similar) codes are readily available at reasonably low cost. (For example, the cost of processing approximately 65,000,000 claims to construct The Urban Institute's California Medicare/Medicaid Claims file was about $200,000.) Scales are highly invariant with respect to the particular distribution point (mean, median, 75th percentile, or 90th percentile) selected to represent a procedure's absolute

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*This work is reported in J. Hadley et al., "Alternative Methods of Developing a Relative Value Scale of Physicians' Services: Year 1 Report," Urban Institute Report 3075-4, February 1983.

charge. Scales constructed from different charge data bases are highly correlated. Scales appear to be stable over time.

The primary concern over using charges to construct relative values is that charges may be distorted because of uneven insurance coverage among different types of procedures, the inherently inflationary effects of C-P-R reimbursement systems used by many insurers, and the alleged noncompetitive structure of the market for physicians. Research has shown that insurance does indeed increase physicians' charges, as do C-P-R reimbursement and non-competitive market structure. It does not follow, though, that if absolute charges are in some sense too high, that relative values constructed from charges will be seriously out of whack compared to what they would be if constructed from "undistorted" charges.

Obviously, however, policy is not limited to choosing only one method. Accordingly, in the study's second year we focused on the process of actually constructing a relative value scale and converting it to a fee schedule. This report consists of five separate, though related studies pertinent to this general focus.

Chapter I, "Relative Value Scales for Physicians' Services," summarizes earlier findings from the evaluation of charge-based RV scales and compares a prototypical charge-based scale to a time-based scale. It shows that the two scales are clearly different. The time-based approach assigns a much lower relative value to hospital-based procedures, especially surgical procedures, than the charge-based scale. But further analysis reveals that at least some of the higher charge-based relative values can be explained by higher complexity and urgency compared to office visits.

The second chapter reviews a number of existing relative value scales and their users. Most RV scales in use are based on charge data or on the

California Relative Value Studies, which were also charge-based analyses. One notable exception is the Massachusetts Medicaid program, which has begun to implement a fee schedule based on a cost-based RV scale constructed from a method developed by William Hsiao and William Stason. This chapter also reviews the status of RV scales under the anti-trust laws.

Chapter III examines some of the distributional consequences of implementing a fee schedule based on average charges submitted to the Medicare program. The analysis consists of simulations of Medicare payments to physicians and patients' cost-sharing liabilities for a large number of California physicians. The simulations are compared to actual Medicare payments and cost-sharing liabilities under the CPR system. The principal result of these comparisons is that a fee schedule based on average charges would not lead to major redistributions of payments or costs among physicians and beneficiaries. Obviously, the extent of redistribution increases as the fee schedule departs from both the absolute and relative fees computed from average charges.

Chapter IV examines one of the specific criticisms leveled at the use of charge data to construct RV scales--that charges are distorted by variations in insurance coverage. Although the measures of insurance coverage used in the analysis are less than ideal, the results suggest that the absolute levels of fees are indeed higher where insurance coverage is better. However, relative fees appear to be largely unaffected by variations in insurance coverage.

The report's last chapter focuses explicitly on the process of constructing both a relative value scale and a fee schedule. As suggested above, the recommended approach is a hybrid of the individual strategies analyzed in the project's first year. Three steps are proposed. The first is construction of a relative cost scale, which would be built from data on procedures' average charge levels and expert panels' opinions of how "profitable" key procedures are. In other words, average costs would be identified primarily by subtracting estimates of average profits from data on average charges. Some cost data, from micro-costing or similar approaches, would also be used in this step.

In the second step, a relative value scale is constructed from the relative cost scale by applying a broader and more subjective definition of value than simply the average cost of production considerations such as benefits and risks to patients, patients' costs, spillover costs to other types of health care services, nonhealth care costs, and policy objectives which go beyond the basic patient/physician transaction would be brought to bear.

In the third step, the resulting fee schedule would be constructed by applying monetary conversion factors or multipliers to the relative value scale. A number of factors pertinent to setting multipliers are discussed.

This chapter also considers a number of organizational issues as well as several other factors pertinent to establishing and maintaining a fee schedule. These include the role of market and competitive forces, the importance of monitoring volume, access, and quality of services, and the difficulty of avoiding judgments at a number of steps in the process.

CHAPTER I

RELATIVE VALUE SCALES FOR PHYSICIANS' SERVICES

Jack Hadley and
David Juba

A. INTRODUCTION

Over the past decade, expenditures for physicians' services in the U.S. grew at a rate in excess of general inflation.* Those large and rapid increases resulted in much public and private concern as government agencies, employers, and the general public found it increasingly difficult to meet the rising costs of medical care.

As a result, there is a growing interest in fee schedules as a possible tool for reining in growth in outlays for physicians' services. Historically, the federal Medicare program and other third party payers reimbursed physicians under a customary-prevailing-reasonable fee approach. Reasonable levels of payment were functions of historical patterns of physicians' billings. Hence, reasonable payment levels tended to grow over time along with billings. Conversely, a fixed schedule of fees would not be subject to such automatic increases.

Among the methods for generating a fee schedule, one of the most straightforward is via the use of a relative value scale (RVS) for physicians' services. Simply put, a relative value scale is a set of numeric values associated with an

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*Freeland and Schendler (1984, p. 35) report that 57.3 percent of the growth in expenditures on physicians' services nationwide between 1972 and 1982 was due to general price inflation. Also, 27.4 percent was due to growth in real expenses per visit, 12.8 percent to increases in fees in excess of general inflation, and 2.5 percent to increases in total physician visits.

array of physicians´ services; complex or otherwise important procedures have a greater scale value than simpler ones. An RVS permits cardinal ordering of procedures. That is, differences in ranked procedures´ scale values are proportional to their "worth" along some dimension.

It is a simple matter to transform any RVS to a fee schedule by multiplying scale values by dollar-per-unit conversion factors. Despite that, it is important to remember that the RVS and any derived fee schedule are distinct entities. The relative "worth" of procedures implicit in the relative value scale need not be preserved in the fee schedule. The extent to which that is the case depends upon the value(s) of the conversion factor(s) that third party payers employ to transform the RVS into a schedule of fees.

This study developes and compares a set of relative value scales for procedures frequently sought by Medicare beneficiaries. The objective is to assess the consistency of procedures´ values across scales developed using different construction methods and from different data bases.

B. RELATIVE VALUE SCALES: DEFINITIONS AND PROPERTIES

In this study, the relative value of the i^{th} medical procedure is:

$$RVS_i = V_i/V_n$$

where V_i and V_n are the "worth" of the i^{th} and numeraire (n^{th}) procedures along some dimension. A property of relative value scales is that the baseline or numeraire procedure may be selected arbitrarily without affecting the rankings of procedures along the scale. Also, procedures´ cardinal values on RVSs based on different numeraires will be identical up to a multiplicative constant.*

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*Let procedures n and k be alternative numeraires. For any procedure (i), relative values on the two scales are related by the equation: $RVS_k(i) = RVS_n(i) * C_{nk}$ where C_{nk} is a constant equivalent to V_n/V_k; the ratio of the absolute worth of the two numeraire procedures.

Another important property of relative values is they are insensitive to simple multiplication of the underlying scale of "worth". Hence, RVS will be unaffected by economic factors which manifest themselves via uniform multiplicative effects on the V scale. For example, general price inflation, a simple multiplier affecting all prices equally, will have no effect on relative prices. Therefore, while price levels may increase over time, RVSs based on such levels need not. More generally, market forces which distort procedures' absolute "worth"" may have little or no effect on RVS scores.

A fundamental task in the creation of an RVS is the identification of an appropriate dimension of "worth" or value. Several candidates are available including physicians' charges and practice time inputs. Other methods depend on estimates of medical practice cost functions, the outcomes of micro costing exercises (where specific factors employed in producing medical services are identified, valued, and summed), and group decision making.* This study compares particular charge-based, time-based, and judgment-based RV scales and offers answers to the question: are procedures' relative values sensitive to the method of scale construction or the underlying data source?

This study employs four sources of physicians' charge data: the Health Care Financing Administration's (HCFA's) 1982 prevailing charge file, The Urban Institute's (UI's) 1974 and 1978 files of Medicare and Medicaid claims from a sample of California physicians, and the Health Insurance Association of America's (HIAA's) surgical prevailing charge file for 1978. The HCFA file contains median values of the customary fees charged by physicians in 238 areas across the country for each of 103 procedures, and the corresponding adjusted and unadjusted Medicare prevailing charges.** Both Urban Institute

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*Hadley et. al. (1983).

**A physician's customary fee is his or her median charge for a service in the calendar year immediately preceeding the fee screen year. HCFA fee files include data on sampled physicians' average billings and Medicare reimbursements, as well as the corresponding customary and locally prevailing fees, for each of 443 procedures. The latter account for over 90 percent of all services provided to California Medicare beneficiaries in each time period. HIAA developed its surgical charge file from data provided by twenty-two commercial insurers for 1978.* Among those data were means, medians, and other points on regional distribution of surgical charges in 250 geographic areas across the country.

This study also develops a time-based RVS from descriptive data on physicians' practices from a nationwide survey conducted by researchers at the University of Southern California between 1974 and 1978.** Among other data, the surveys obtained information on the physician-patient encounter including: the amount of time physicians spent with patients, the encounter's location, and the procedure's complexity.

In order to contrast alternative RVS, it is necessary to evaluate a common set of procedures on each scale. Unfortunately, the survey on physician's time does not identify particular procedures by code number. To compensate, this study uses the available survey data to assign plausible CPT-4 codes for fifteen different types of visits to the physician-patient encounters.***

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screen year 1982 covers July 1981 through June 1982. Hence, customary fees are based on calender years 1980 charges. The unadjusted prevailing charge for a procedure is the 75th percentile on the areawide distribution of customaries. Adjusted prevailing fees result from application of HCFA's Medicare Economic Index, which restricts the permissible annual rate of increase in local prevailing fees. See Paringer (1981) for details.

*The year covered spans September 1977 through August 1978.

**Those researchers distributed log diaries to approximately 10,000 medical and surgical specialists (Mendenhall et.al., 1980). The present study restricts its attention to responses recorded by members of five specialties: general and family practice, internal medicine, general surgery, and pediatrics.

***The American Medical Association's Current Procedure Terminology (CPT-4), a detailed set of procedures and accompanying code numbers.

Assigning codes for diagnostic and therapeutic procedures is more difficult because descriptions recorded on the survey instruments are much less precise than in the CPT-4 manual. As a result, the study evaluates only 13 nonvisit procedures along the time-based RV scale.

Finally, the study makes use of an existing, judgment-based scale developed by Mountain Medical Affiliates (MMA), a physicians' practice association in Denver, Colorado. MMA reports that committees of physicians developed that RVS by adjusting and refining the 1975 and 1976 versions of the Colorado Relative Value Scale to better represent the complexity, training, skill, outcome, and cost associated with each procedure.*

C. METHODS

1. Alternative Relative Value Scales

To investigate the degree of correspondence among procedures' values on RV scales derived from common data sources, the study develops twelve charge-based scales from both the HCFA and 1978 Urban Institute files. As reported in Table I-1, the different scales correspond to different choices of representative charge per procedure. The study develops the twelve scales by defining four representative points on the distributions of three types of charge for each procedure. The four representative points are: mean, median, 75^{th}, and 90^{th} percentiles. Charge types include: regional median customary fees, and adjusted and unadjusted prevailing charges on the HCFA file, and physicians' mean billings, mean reimbursements, and customary fees on the 1978 UI file.

Relative values are ratios of each procedure's representative charge to that of a chosen numeraire. As numeraire, the study selected a well-defined, frequently-performed procedure (brief office visit: established patient.)

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*Mountain Medical Affiliates (1981).

Table 1

Description: Charge- and Time-Based Relative Value Scales

Data Source	Unit of Observation	Charge Types	Representative Charge Defining a Scale
HCFA 1982 Prevailing Charge File	charges for 103 procedures in 238 areas nationwide	• median of regional customary fees • adjusted regional prevailing charge • unadjusted regional prevailing charge	on the nationwide distribution of regional fees: • mean • median • 75^{th} percentile • 90^{th} percentile
Urban Institute 1974 and 1978 California Claims Files	charges of sampled physicians for 443 procedures	• physician's mean billing • physician's mean reimbursement • physician's customary fee	on samplewide distribution of charges: • mean • median • 75^{th} percentile • 90^{th} percentile
HIAA 1978 Surgical Prevailing Charge File	charges for surgical procedures in 250 areas nationwide	• regional median charge	on the nationwide distribution of regional charges: • 75^{th} percentile
University of Southern Calif. 1978 Survey	log diaries from approx. 10,000 physicians	• mean time per procedure	on samplewide distribution of mean times: • mean • median • 75^{th} percentile • 90^{th} percentile

The study also constructs charge-based RV scales from the 1974 UI and 1978 HIAA surgical procedure files. In the former case, 75^{th} percentiles on sample-wide distributions of physicians' mean billings per procedure serve as representative fees. The 75^{th} percentile points on nationwide distributions of local median surgical charges serve that purpose for the HIAA data-based scale.

The study also constructs four time-based RVSs from the University of Southern California survey data. The four are based on the mean, median, 75^{th} and 90^{th} percentile points on distributions of average time per procedure as reported by survey respondents. Relative values are the ratios of representative time per procedure to that of the numeraire, limited office visit: established patient.

2. Analytic Methods

A purpose of this study is to determine the extent to which pairs of RV scales contain the same salient information. Clearly, identical procedures' scores imply identical scales. Furthermore, this study adopts the norm that a scale's information content is preserved under linear transformation. That is, multiplying each procedures' score by a constant or adding a constant to each scale value leaves the salient information on the scale unchanged.

Under that norm, pairs of RVSs will be considered to convey identical information on medical procedures if one scale is a linear transformation of the other.* The Pearson product-moment correlation coefficient (r) is a well known measure of how well a linear model fits the data on procedures' scores on two scales. For that reason, correlation analysis is the primary tool for this investigation.

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*Identical scales are also linear transformations of each other via the transformation equation $y = 0 + 1*x$ where x and y are procedures' scores on the two scales.

It will prove useful to define the Pearson correlation coefficient between two scales X and Y as:

$$r = b_{yx}(s_x/s_y)$$

where b_{yx} is the slope of the least squares regression of Y on X, and s_y and s_x are the standard deviations of procedures' values on the respective scales.*

The Pearson coefficient is proportional to the slope of the lease squares regression between the scales but, unlike the slope, is constrained to vary between -1.0 and 1.0 in value. That property facilities comparison of the relationship among several pairs of scales, and makes correlation analysis somewhat more useful than regression analysis for this study.

It is also informative to focus on the rankings of procedures on the alternative scales. Therefore, the study also computes Spearman rank order correlations, interpretable as the product-moment correlations between procedures' rankings on RV scales.**

Statistically significant Pearson and Spearman correlations close to 1.0 in value are evidence that the RVS in question are substitutable in many empirical applications such as generating physicians' fee schedules.

D. RESULTS

1. Comparing Scales from a Common Data Base

Correlation analysis supports the assertion that the set of twelve RV scales based on HCFA charge data provide the same salient information on the

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*See Blalock (1972, pp. 361-426) for alternative definitions of correlations coefficients, and for discussion and interpretation of correlation and regression analyses.

**See Blalock (1972, p. 416) for a description of the Spearman correlation coefficient and intepretation of its meaning.

value of medical procedures. That assertion also holds for the set of twelve RVS based on the 1978 UI California data and, to a lesser degree, for the four time-based scales.

Pearson and Spearman coefficients between pairs of HCFA data-based scales were always statistically significant and in the range 0.96 to 0.99 in value. Similarly significant (99 percent level) correlations held between pairs of relative value scales based on the UI California data. Pearson and Spearman coefficients were uniformly between 0.95 and 0.99 in those analyses. With one exception, correlations between pairs of time-based scales followed that pattern. But for that one case, correlations between procedures' values on the time-based scales ranged between 0.90 and 0.99 in value.*

The foregoing results support the conclusion that the point on charge or time distributions selected as representative will not appreciably affect RVS scores. Similarly, the type of charge data underlying the scales---billings, prevailing fees, reimbursements---has little effect on procedures' relative values. Implicitly, any reasonable well constructed RV scale will serve as representative of the class of possible scales derivable from a single source of data on charges or physicians' time input.

2. Comparing Scales from Different Data Bases

How similar are RVS developed from data collected in different areas or at different points in time? To investigate that question, the study contrasts procedures' values on five scales: one each from the sets of twelve HCFA and 1978 Urban Institute California data-based scales, the third derived from 1974

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*The one exception was a Pearson correlation value of 0.81 between the RVS based on the median and 90th percentile points on the distribution of average time per procedure.

UI data, the fourth based on HIAA surgical charge information, and the fifth the judgemental scale constructed by Mountain Medical Affiliates Incorporated.

Representative values per procedure on the HCFA scale are 75th percentiles on nationwide distributions of regionial median customary charges. Representative charges on the second scale (78CAL) are 75th percentile of California physicians' mean billings per procedure in 1978. Replacing that data with analogous 1974 valves generates the third scale (74CAL). Surgical procedures' values on the fourth scale (HIAA) are set at the 75th percentile of nationwide distributions of regional median charges as found on HIAA's 1978 file of surgical fees. Procedures' representative values on the five scales are normalized by expressing them relative-to the representative value of the numeraire (needle puncture of bursa.)

The study computed Pearson and Spearman correlation coefficients for procedures' values on pairs of scales. Those are in Table I-2 along with information on the number of procedures common to the scales in each pair. Since a coefficient of 1.0 indicates perfect correlation, those results indicate strong similarities in values of procedures among the five scales; the produce-moment and rank-order coefficients exceed 0.94, uniformly.*

As already discussed, the Pearson coefficient (r) is one measure of how well a linear model captures the inherent relationship between pairs of RVS. However, that discussion also revealed that the coefficient is the product of two elements: the slope of the linear regression line between scales, and the ratio of corresponding standard deviations of procedures' values on them. It

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*A companion analysis investigated correlations among RVS values for procedures in particular categories: medicine, surgery, radiology, and pathology. Of the 56 Pearson and Spearman coefficients in that analysis, 45 exceeded 0.90, and the remainder ranged between 0.82 and 0.89 in value. That suggests that outliers (procedures with extremely large or small RVs) are <u>not</u> generating spuriously large correlations since high levels of correlation are observed across procedures in groups with low, middle, and high relative values on average.

Table 2

Correlations among RVSs Constructed from Different Data Bases (number of observations in parentheses)[1]

Pearson Product Moment Correlations[2]

	MMA	HIAA[5]	78CAL[4]	74CAL[4]
HCFA[3]	.978 (95)	.952 (21)	.998 (83)	.998 (82)
MMA		.972 (21)	.982 (77)	.979 (76)
HIAA			.999 (13)	.999 (13)
78CAL				.999 (82)

Spearman Rank-Order Correlations[2]

	MMA	HIAA[5]	78CAL[4]	74CAL[4]
HCFA[3]	.948 (95)	.978 (21)	.979 (83)	.975 (82)
MMA		.963 (21)	.960 (77)	.965 (76)
HIAA			.994 (13)	.996 (13)
78CAL				.994 (82)

Notes:
1. Limited to procedures common to all five RVSs.
2. All correlations significant at .0001 level.
3. Constructed from the 75th percentile of the distribution of median customary fees across areas.
4. Constructed from the 75th percentile of the distribution of mean billed charges across physicians.
5. Constructed from the 75th percentile of the distribution of median surgical charges across areas.

is possible that the observed strong correlations of Table 2 were driven more by the variability of procedures´ scores on the scales (i.e., by large s_x/s_y ratios) than by a strongly linear relationship and Appendix I.

To investigate that possibility, the study generated ordinary least squares regression estimates of linear relationships between the ten pairs of scales:

$$Y = a + bX$$

It also computed standard deviations of the values of procedures common to the scales in question. The estimates values of the slopes (b) and corresponding ratios of standard deviations (s_x/s_y) are in Table I-3.

Those results show that the strong correlations of Table 2 are more a function of the inherent linearity between pairs of RV scales under investigation than of any gross differences in the variation of procedures´ scores. All estimated slopes were significant at the 99 percent level and took values in the range 0.71 to 1.29. As the Pearson coefficients are the product of those values and corresponding ratios of standard deviations, the latter must necessarily fall in a relatively narrow range about 1.0. That is confirmed by the data in Table 3; computed s_x/s_y ratios range between 0.753 and 1.413 in every case. Policy makers are also interested in the estimates of the constant term (a) in the regressions. If that additive term is not statistically different from zero, then the relationship between the associated RV scales is strictly multiplicative. That is, one scale is a simple multiple of the other. In that case, equivalent fee schedules can be generated from either scale via the use of scale-specific conversion factors that are also simple multiples of each other.

Regression estimates of the additive constants (a) support the argument that the five RV scales under investigation are essentially simple multiples of each other. In seven of ten regressions, the estimated constant was not statistically significant even at the 70 percent confidence level. In the three cases

Table 3

Regression Results[a]
Estimated Slope of Linear Relationship
Between Pairs of RV Scales

(s_x/s_y in parentheses)

Dependent Scale Y	Explanatory Scale X: MMA	HIAA	78CAL	74CAL
HCFA	0.86 (1.131)	0.90 (1.057)	0.72 (1.381)	0.89 (1.125)
MMA		1.29 (0.753)	0.89 (1.099)	1.09 (0.896)
HIAA			0.71 (1.413)	0.88 (1.129)
78CAL				1.23 (0.815)

[a]In all regressions, coefficients were significant at the 0.99 percent level or better. All unadjusted R-square values greater than or equal 0.96.

when the constant was significant at the 90 pecent level or better, the absolute magnitude of the estimate was small, less than 0.90. By comparison, means values of procedures on the scales in question ranged between 5.5 and 10.7.

Reestimation of the ten regression equations with the constant term suppressed confirmed the insensitivity of estimated slopes to the presence or absence of the constant. Those regressions, reported in the appendix, reveal that corresponding estimates of (b) with and without the constant were virtually identical.

E. COMPARING TIME-BASED AND CHARGE-BASED SCALES

This study also contrasts values on representative time- and charge-based relative value scales. Physicians' time is but one of many inputs to the production of medical services. Consequently, it is but one element contributing to the underlying value of a particular procedure. If a strictly time-based RVS is to have validity, one must presume that the values of the other inputs are directly proportional to the value ascribed to the time input. That condition may hold for such time-intensive procedures as visits, but may be less plausible for capital-intensive services such as radiology and pathology. On the other hand, in theory, physicians' charges are likely to be proportional to the total value of all inputs. For that reason, at least, some procedures might be valued differently on time- and charge-based scales.

Another reason for possible differences in procedures' values on the two types of scales is the possibility that the value of a unit of time might vary across physicians. Practitioners with the greatest investment in training, experience, or other determinants of human capital might value their time greater than do other physicians---that is, they might set a higher implicit wage---and would charge accordingly.

Table 4

Time-Based and Charge-Based
RV Scales, 24 Procedures

Procedures (CPT-4 Code)	Relative Value, Absolute Value (Scale Rank)	
	Time-Based[a]	Charge-Based[b]
1. Brief H.V. Estab. Pat. (90240)	0.68, 8.04 mins. (1.00)	0.96, $15.52 (3.00)
2. Minimal O.V. Estab. Pat. (90030)	0.72, 8.61 (2.00)	0.51, 8.26 (1.00)
3. Brief O.V. Estab. Pat. (90040)	0.77, 9.13 (3.00)	0.85, 13.72 (2.00)
4. Brief O.V. New Pat. (90000)	0.85, 10.08 (4.00)	1.32, 21.34 (8.00)
5. Limited H.V. Estab. Pat. (90250)	0.96, 11.44 (5.00)	1.25, 20.11 (5.00)
6. Limited O.V. Estab. Pat. (90050)	1.00, 11.87 (6.00)	1.00, 16.10 (4.00)
7. Brief H.V. New Pat. (90200)	1.11, 13.13 (7.00)	2.46, 39.69 (15.00)
8. Chemotherapy (96030)	1.17, 13.88 (8.00)	1.30, 20.91 (6.00)
9. Limited O.V. New Pat. (90010)	1.23, 14.63 (9.00)	1.70, 27.38 (12.00)
10. ECG (93000)	1.36, 16.19 (10.00)	1.71, 27.68 (13.00)
11. Extended H.V. Estab. Pat. (90270)	1.40, 16.67 (11.00)	2.12, 34.18 (14.00)
12. Extended O.V. Estab. Pat. (90070)	1.50, 17.85 (12.00)	1.65, 26.71 (11.00)
13. Brief Home V. Estab. Pat. (90140)	1.52, 18.08 (13.00)	1.30, 20.92 (7.00)
14. Limited Home V. Estab. Pat. (90150)	1.69, 20.04 (14.00)	1.52, 24.54 (9.00)
15. Arthrocentesis (20610)	2.03, 24.12 (15.00)	1.59, 25.62 (10.00)

To investigate the possible differences between time- and charge-based RVS, representatives of each class are developed. The time-based scale is based on mean time per procedure as reported on the University of Southern California (USC) survey. Underlying the representative charge-based scale are mean unadjusted prevailing fees from the HCFA data file. Representative fees per procedure are expressed relative-to the corresponding fee for the numeraire procedure (limited office visit: established patient).

In Table I-4 are relative values for the 24 procedures common to both scales in the order of their rank on the time-based scale. The consistency between the rankings on the two scales is captured by the relatively high Spearman coefficient, 0.90. The corresponding 0.81 value of the Pearson coefficient suggests that there are some discrepancies between certain procedures values on the two scales. Separating them into visits and nonvisits is informative. Subsequent correlation analysis generated a Pearson value of 0.88 between values of visits on the two scales, but a value of only 0.71 for the nonvisits.

Ratios of charge-based and time-based scale values further illuminate differences. The study computed such ratios for procedures in each of four groups: office visits, hospital visits, operations, and all others. If the two scales are substantially the same, that is, all physicians' time valued equally and all nonphysician costs proportional to it, then ratios of scales' values should be approximately identical across procedure categories. In fact, that was not the case. Mean charge-based relative values are about 6.0 times greater than mean time-based values for surgical procedures, 45 percent greater for hospital visits, 20 percent greater for office visits, and approximately equivalent for the remaining procedures.

Several factors could explain that result. Two have already been mentioned: differences across physicians in the amounts of training and skill

Table 4 (Continued)

Time-Based and Charge-Based
RV Scales, 24 Procedures

	Time-Based	Charge-Based
16. Comprehensive O.V. New Pat. (90020)	2.16, 25.68 (16.00)	3.14, 50.71 (18.00)
17. Comprehensive O.V. Estab. Pat. (90080)	2.27, 26.98 (17.00)	2.68, 43.25 (16.00)
18. Comprehensive H.V. New Pat. (90220)	3.14, 37.30 (18.00)	3.73, 60.18 (19.00)
19. Herniorrhaphy (49505)	3.52, 41.82 (19.00)	27.2, 439.38 (20.00)
20. Thoracentesis (32000)	3.71, 44.11 (20.00)	3.08, 49.75 (17.00)
21. Hysterectomy (58265)	4.73, 56.13 (21.00)	53.3, 861.21 (23.00)
22. Cholecystectomy (47600)	5.02, 59.62 (22.00)	43.7, 705.65 (22.00)
23. Colon Resection (44140)	8.27, 98.25 (23.00)	60.20, 972.29 (24.00)
24. Heart Catherization (93527)	10.20, 120.92 (24.00)	33.00, 532.28 (21.00)
All Procedures		
Mean	2.54	10.47
Standard Deviation	2.37	17.85
Pearson Correlation	0.81	
Spearman Correlation	0.90	

Notes: a. Mean time per procedure in minutes.

b. Mean HCFA (unindexed) prevailing charges in dollars.

needed to provide different types of procedures, and differences in the kinds and costs of equipment and other personnel included in physicians′ charges for procedures in the groups. A third factor may be variations in insurance coverage for different classes of procedures. For example, hospital visits may be covered more often, and more fully, than office visits.

Another possibly important factor influencing charge-based relative values is differences in interphysician competition by procedure type. Looking at relative values for office and hospital visits, competition among physicians and patients′ price sensitivity are probably greater for office visits than for hospital visits. Once the patient is hospitalized, the physician is much closer to being a monopoly provider. As a result of those market forces, charges for time spend providing office visits might be lower than charges for time spend providing hospital visits, even if the physician′s other costs are higher in the office than in the hospital.

Sorting out the full effects of those factors is beyond the scope of this study. However, other data from the USC file provide information pertinent to the issue by permitting comparisons of several characteristics of office and hospital visits with similar nominal designations---brief, limited, extended, and comprehensive. The characteristics available from the log-diaries were: severity of illness, urgency of visit, physician′s primary specialty, and an indicator of board certification of physician. (All terms used in the definition of severity and complexity are taken directly from the log-diary reporting form.)

Table I-5 shows that, within each nominal visit category, hospital visits compared to office visits had higher proportions of more severe and more urgent cases and were more likely to be provided by physicians with specialty training or board certification. A comparison of limited office and hospital visits (for established patients) is instructive. These two are the most

TABLE 5

Selected Characteristics of Office and Hospital Visits

Procedure (CPT-4 Code)	Characteristics: No. of Encounters	Severity[a]: None or Minor[b]	Severity[a]: Moderate[b]	Severity[a]: Severe[b]	Urgency[c]: None or Deferrable	Urgency[c]: Same Day	Urgency[c]: Sooner or Emergency
1. Brief Off. Vis., Estab. Patient (90040)	26,843	73.5%	24.0%	2.2%	49.1%	48.2%	2.3%
2. Brief Hosp. Vis., New Patient (90200)	3,949	38.1	46.6	14.9	19.6	71.0	8.4
3. Limited Off. Vis., Estab. Patient (90050)	29,736	53.2	42.4	4.3	42.6	53.4	3.5
4. Limited Hosp. Vis., Estab. Patient (90250)	7,905	19.3	56.1	24.6	12.3	82.5	4.7
5. Extended Off. Vis., Estab. Patient (90070)	3,595	19.8	61.1	18.8	39.0	53.0	7.2
6. Extended Hosp. Vis., Estab. Patient (90270)	4,571	4.9	52.2	42.8	9.3	72.1	18.1
7. Comp. Off. Vis., New Patient (90020)	1,485	36.65	48.1	14.7	45.8	33.3	20.4
8. Comp. Off. Vis., Estab. Patient (90080)	1,246	29.14	44.5	26.2	48.7	41.7	8.3
9. Comp. Hosp. Vis., New Patient (90220)	1,088	8.05	30.3	61.3	8.1	46.5	45.2
All Visits	80,418	50.4	39.2	10.2	38.3	55.8	5.4

Procedure (CPT-4 Code)	Primary Specialty of Physician[d]: Family or General Prac.	Gen. Surg.	Int. Med.	Ped.	Pct. Physicians Board-Certified
1. Brief Off. Vis., Estab. Patient (90040)	52.1%	5.7%	15.6%	23.9%	9.1%
2. Brief Hosp. Vis., New Patient (90200)	23.2	12.8	33.9	24.9	19.2
3. Lim. Off. Vis., Estab. Patient (90050)	38.8	3.5	19.2	35.7	12.1
4. Lim. Hosp. Vis., Estab. Patient (90250)	28.7	13.0	41.3	12.0	28.4
5. Ext. Off. Vis., Estab. Patient (90070)	43.5	6.2	31.4	12.8	20.5
6. Ext. Hosp. Vis., Estab. Patient (90270)	33.3	15.1	37.5	8.5	20.8
7. Comp. Off. Vis., New Patient (90020)	35.2	8.2	29.4	20.4	16.3
8. Comp. Off. Vis., Estab. Patient (90080)	31.8	2.8	47.6	12.9	33.5
9. Comp. Hosp. Vis., New Patient (90220)	18.8	6.3	50.9	14.3	26.7
All Visits	41.0	6.5	23.5	25.4	14.5

Notes: a. Percentage distribution of encounters in each procedure by severity.

b. Combines acute and chronic conditions.

c. Percentage distribution of encounters in each procedure by urgency.

d. Percentage distribution of primary specialties of physicians providing encounters.

frequently performed of the hospital and office visits reported in Table 5. Furthermore, the differences in their characteristics are representative of the reported differences between all pairs of hospital and office visits. The liklihood that hospital visits require more (or more sophisticated) medical treatment per episode than do office visits is reflected in the relative frequency of "severe" cases in each. Table 5 shows that almost 25 percent of limited hospital visits are so categorized, in contrast to only 4.3 percent of the limited office visits. Furthermore, physicians judged 82.5 percent of the hospital visits to require "same-day" treatment; the corresponding figure for office visits was only 53.4 percent.

Even if hospital and office visits were of the same urgency and severity, and even if they consumed equal amounts of physicians' time, their relative values might differ due to differences in the training or skill levels of the attending physician. Table 5 shows that 28.4 percent of the providers performing limited hospital visits were board-certified in contrast to the 12.1 percent of the physicians performing the limited office visits. Also, proportionately fewer general practitioners were among the physicians performing hospital (in contrast to office) visits. From a normative perspective, if one permits physicians' charges to vary directly with case complexity or with differences in training costs, then at least some of the differences in the ratios of charge-based to time-based relative values may be appropriate.

F. DISCUSSION AND POLICY IMPLICATIONS

This study examined alternative method of constructing relative value scales for physicians' services. Its results suggest that relative value scales constructed from charge data are quite robust with respect to the source of the data and the method of construction. The study also contrasted time-based and charge-based scales. The correlation between them was not as high as in comparisons of charge-based scales.

There are at least two possible reasons for those findings. First, average observed physicians' time per procedure may not sufficiently capture variations in the value of different physicians' time or the cost of complementary inputs to the production of medical care. Second, comparison of characteristics of office and hospital visits showed the latter to be more difficult, more urgent, and more likely to be provided by specialists. Thus, both theory and evidence suggest that relative values derived from charge data might be better indicators of the myriad factors that influence procedures' value than are relative values derived solely from time inputs.

Developing a relative value scale is important because it is a key element in the construction of a physicians' fee schedule, although the RVS is not identical to such a schedule. This research contributes to the debate over the possibility of implementing a Medicare fee schedule for physicians' services by suggesting that the issues of how to construct a RVS, and whether different scales are needed for different purposes, need not receive top priority.

If the RVS is accepted as given, then two other issues dominate the debate. One is the question of the absolute levels of fees to be established under the schedule. This is essentially a physicians' earnings vs. insurers' cost issue, since relative fees would remain the same for any dollar-per-unit conversion factor. The second issues is the use of multiple factors to transform relative values into relative fees. This is a more complex issue, having both equity and efficiency aspects. On equity grounds, one could argue that different conversion factors should be used because of real differences in practics costs across regions or specialties. Differential rewards or penalties should not be imposed on physicians because of factors largely outside the implicit benefit/cost calculations that should be influenced by a fee schedule. The efficiency argument for different conversion factors is that some procedures are either over- or under-provided and relative fees need to be manipulated to correct such distortions. For example, if preventive or so-called cognitive services lead to better health outcomes (at equal or lower cost) than therapeutic or non-cognitive services, then procedures in the former categories should have larger multipliers than those in the latter.

The other side of the coin in this debate concerns physicians' likely responses to variations in relative fees. Empirical studies have shown that physicians might be influenced by relative fees when deciding whether or not to treat Medicaid beneficiaries, or to accept assignment of Medicare patients.* Other studies suggest that physicians' location decisions are influenced by income opportunities which, presumably, are affected by regional fee differences.** The evidence regarding the impact of fees and incomes on specialty choices is that there is, at best, a small influence, although there has been relatively little work in that area.*** Finally, there are no studies of the impact of relative fees on physicians' choices of medical procedures.

Constructing relative fee schedules which differ from the underlying relative value scale in order to influence physicians' behavior probably requires more research on how physicians respond to relative fees. In the short run, however, pressures to reduce spending for physicians' services and the rate of inflation of physicians' fees may lead to the adoption of fee schedules as cost cutting measures.

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*See: Hadley (1979), Sloan et. al. (1978), and Paringer (1980).

**See: Hadley (1980 and 1982).

***See: Hadley (1980), Lee (1980), and Fruen (1980).

APPENDIX I

RV Scale Regressions: With and Without Constant
(t statistics)

Dependent Scale (No. of Procedures)		Constant		Explanatory Scale	Unadjusted R-square
1) HCFA	=	-0.85	+	0.86 MMA	.963
[95]		(-1.84)		(44.86)	
			+	0.85 MMA	.962
				(48.58)	
2) HCFA	=	1.32	+	0.90 HIAA	.959
[21]		(0.79)		(13.55)	
	=		+	0.94 HIAA	.958
				(21.25)	
3) HCFA	=	0.07	+	0.72 CAL78	.997
[83]		(0.85)		(145.32)	
			+	0.72 CAL78	.997
				(156.90)	
4) HCFA	=	0.01	+	0.89 CAL74	.997
[82]		(0.15)		(153.68)	
			+	0.89 CAL74	.997
				(166.80)	
5) MMA	=	1.77	+	1.29 HIAA	.978
[21]		(0.98)		(18.11)	
			+	1.34 HIAA	.975
				(28.08)	
6) MMA	=	0.79	+	0.89 CAL78	.970
[77]		(2.24)		(45.08)	
	=		+	0.91 CAL78	.968
				(48.27)	
7) MMA	=	0.76	+	1.09 CAL74	.965
[76]		(1.94)		(40.93)	
	=		+	1.11 CAL74	.963
				(44.25)	
8) HIAA	=	0.35	+	0.71 CAL78	.999
[13]		(1.04)		(64.75)	
	=		+	0.72 CAL78	.999
				(97.36)	
9) HIAA	=	0.16	+	0.88 CAL74	.999
[13]		(0.57)		(79.26)	
	=		+	0.89 CAL74	.999
				(123.03)	
10) CAL78	=	-0.07	+	1.23 CAL74	.998
[82]		(-0.75)		(174.94)	
	=		+	1.22 CAL74	.998
				(188.86)	

CHAPTER II

EXISTING RELATIVE VALUE SCALES AND THEIR USERS

David Juba

In 1956, the California Medical Association published the first edition of the California Relative Value Studies series. Other medical societies, insurers, and government agencies eventually adopted it or constructed their own RV scales using the CRVS as a prototype. The development and proliferation of physicians' relative value scales continued for nearly a quarter century until federal antitrust activity intervened.

In this chapter, we identify alternative RV scales and the agencies and institutions employing them across the country. Given the preeminence of the California Relative Value Studies among RV scales, we present an overview of the CRVS emphasizing its influence on other scales and systems for defining medical procedures. We also review the legal status of relative value scales, and discuss regulators' attempts to halt their proliferation on antitrust grounds.

A. THE CALIFORNIA RELATIVE VALUE STUDIES

The forward to the first edition of the CRVS contained a succinct rationale for its development:

> For many years, the medical profession has recognized the need for a guide or 'rule of thumb' measurement which could be used to improve fee schedules. In 1952 the Commission of Medical Services of the California Medical Association appointed a subcommittee and directed it to develop a set of guiding principles which should govern the development of fee schedules.

The product of that subcommittee, later called the Committee on Fees, was the landmark 1956 edition of the California Relative Value Studies. Subsequent editions followed in 1957, 1960, 1964, 1969, and 1974.

By design, the CRVS was to be a tool facilitating the construction of physicians' fee schedules. In keeping with that objective, the Committee on Fees furnished it with the essential elements of a fee schedule including:*

- uniform nomenclature or descriptions of medical procedures
- a standardized coding system facilitating comparison of one fee schedule with another
- unit (relative) values per procedure expressed in _other than_ dollars
- correct segmentation of procedures; relative (unit) values to be comparable only across procedures within a particular segment or grouping

The first edition of the CRVS contained information on about 1,000 procedures in four basic groups or segments: medicine, radiology, surgery, and lab and pathology. As Showstack et al. (1979) observed:

> the rationale for the four sections was that because different medical specialties were subject to differing rates of change in technology and ratios of gross to net income, changes in a single conversion factor, if used for all specialties, would yield disproportionate increases in income to different specialties.

The CRVS grew in size with subsequent editions; by 1974 it contained nomenclature, codes, and unit values for approximately 5,500 procedures.

Physicians' charges were the basis of unit values in all editions. From 1956 through 1964, the Committee on Fees obtained charge data from direct surveys of California physicians. The Committee determined RVs from modal and median values of those data for each procedure. Starting with the 1969

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*Abstracted from the forward to the 1956 California Relative Value Studies.

edition, the Committee developed procedures' unit values from median billings using data provided by California's Blue Shield plan. As the CRVS is charge-based, so too are the scales derived from it.

Even though the CRVS was developed as a tool for improving fee schedules, the California Medical Association (CMA) was adamant that the scale was not, itself, a fee schedule. That disclaimer notwithstanding, it is easy to convert any edition of the CRVS to a fee schedule by applying one or more conversion factors. Implicitly, any medical society-sponsored RV scale could become a set of suggested market prices. That possibility prompted federal antitrust actions against medical societies sponsoring RV scales during the mid-1970s.

The influence of the CRVS on medical practice nationwide was documented in a 1979 Senate Governmental Affairs Committee report. The accompanying Table II-1 from that source lists sixteen specialty societies and other organizations employing the California Relative Value Studies, as well as the twenty states whose medical societies adopted it.*

An important property of the CRVS, and a measure of its potential influence on the American medical community, is its wide distribution. Between April 1975 and June 1977, the CMA distributed 85,600 copies of the 1974 edition; of those, 61,600 went to nonmembers. Furthermore, by 1979, there were approximately 300,000 copies of the 1964 and 1969 editions in

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*Showstack et al. (1979, p. 238) reported results of a 1971 American Medical Association survey which "showed that 18 state medical associations had published an RVS (with two additional states in the planning process), while four specialty societies (with another five in the planning stage) had done likewise." We were unable to locate copies of the AMA survey report to determine the nature of those scales; i.e., which were versions of CRVS, which were designed independent of the California scale, etc.

Table II-1

Chart Showing Use of CRVS and CPT by Other State Medical Societies, Specialty Societies, and Other Groups

CRVS

American Medical Association

***State Medical Societies using CPT for their RVS book:**

- Alabama
- Colorado
- Delaware
- District of Columbia
- Illinois
- Kansas
- Massachusetts
- Michigan
- Minnesota**
- Nebraska
- New York
- North Carolina
- North Dakota
- Utah

State Medical Societies using California RVS:

- Arizona
- Arkansas
- Delaware
- Florida
- Idaho
- Louisiana
- Maine
- Maryland
- Nevada
- New Hampshire
- New Jersey
- New Mexico
- Oklahoma
- Oregon
- South Dakota
- Tennessee
- Vermont
- Virginia
- Washington

Specialty Societies or Groups using CRVS in part or in whole:

- American Academy of Dermatology
- Bermuda Medical Society, Paget, Bermuda
- Mutual of Omaha, Omaha, Nebraska
- Blue Cross/Blue Shield of Arizona
- National Life & Accident Insurance Co., Nashville, Tennessee
- The Travelers Insurance Companies, Hartford, Connecticut
- Pan American Life Insurance Co., New Orleans, Louisiana
- Employees Compensation Commission, Manila, Philippines
- Aetna Life & Casualty, Hartford, Connecticut
- Asociacion Medica de Porto Rico, Santurce, Puerto Rico
- California Society of Internal Medicine, San Francisco, Calif.
- State Hospital Commission, State of Washington, Olympia, Wash.
- Allstate Employee Group Health Insurance Plan, Northbrook, Illinois
- Bureau of Rehabilitation Services, Department of Education, Commonwealth of Kentucky
- Workmen's Compensation Commission of the State of Maryland
- Mississippi Foundation of Medical Care Inc., Jackson, Miss.

*Based on data obtained from the AMA, CMA, & FTC. This information has not been verified by us in any way and we have not ascertained which revision is being used.

**The Federal Trade Commission has accepted from the Minnesota State Medical Association and its 34 local components a consent order agreement to cease the use of the Minnesota Relative Value Index and to withdraw such publications already in circulation. According to the FTC's proposed complaint relative value scale activities "have established, maintained, or otherwise influenced fees charged health care consumers in violation of the FTC Act." The consent agreement states that it does not constitute an admission by MSMA or any component society that the law has been violated, and that it is for settlement purposes only.

Source: The California Relative Value Studies: An Overview. A study prepared for the Permanent Subcommittee on Investigations of the Committee on Governmental Affairs, United States Senate, April 1979.

circulation; about 160,000 in the hands of other than CMA members across the country.*

As we discuss subsequently, by the mid-1970s, the Federal Trade Commission had begun proceedings aimed at halting the further development and distribution of CRVS. In 1977, legal counsel advised the CMA to enter into a consent agreement with the Commission, at which time the CMA ceased distribution and development of its relative value scale. Despite that, the CRVS continues to influence the physicians' services sector. This is a function not only of the wide circulation it enjoyed, but of the extent to which its nomenclature was adopted by medical societies, government, and third-party payers. For example, the American Medical Association's Current Procedure Terminology (CPT) series was based, to some degree, on CRVS descriptors.** As many state medical societies based their own RV scales on CPT definitions (see Table II-1), those scales are influenced by the CRVS.

B. USERS OF RV SCALES

A recurrent theme in this discussion is that RV scales are important tools for establishing physicians' fees. As Showstack et al. (1979) reported, institutions in three classes used them for establishing maximum reimbursement schedules. They are: state Medicaid programs, workers' compensation programs, and commercial insurance companies. We examined available secondary data and undertook a small-scale telephone survey of insurers and Medicaid

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*U.S. Senate Committee on Governmental Affairs (1979, p. 47).

**Ibid (pp. 44-48). The Senate Governmental Affairs Committee reported that the developers of the third and fourth editions of the AMA series (CPT-3 and CPT-4) relied heavily on the 1969 and 1974 versions of CRVS for procedure nomenclature and coding.

programs to determine whether or not they still employ RV scales for that purpose. (Table II-2 lists the agencies and groups contacted.)

We contacted representatives of four major commercial insurers: Equitable, Travelers, Aetna, and Mutual of Omaha. A general finding was that local branches employ RV scales, but not generally for setting maximum benefit schedules. Rather, insurers use the scales primarily for filling-in gaps in UCR-type charge screens. Our contacts related that the particular scales in use can vary with the region of the country and that some are based on the billings experience of local plans. It may be true that some commercial carriers employ the CRVS or some other RV scale for establishing maximum benefits schedules; however, our small-scale survey failed to uncover particular examples.

Also from secondary sources, we identified ten state Medicaid programs which paid physicians according to RVS-based fee schedules.* These are:

California	Massachusetts
Colorado	Nevada
Connecticut	New York
District of Columbia	South Carolina
Florida	Washington

Our sources also indicated that programs in three of these states (California, Nevada, and South Carolina) employed versions of the CRVS for determining reimbursement levels.

Foundations for medical care (FMCs) and preferred provider organizations (PPOs) also employ fee schedules derived from relative value scales. FMCs contract with physicians who provide services to beneficiaries of FMC-sponsored insurance plans. By agreement, the physicians accept the FMC payment as payment-in-full. PPOs are organizations that contract with a

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*Holahan (1981); Commerce Clearing House Inc.; Babin (1984).

Table II-2

Insurance Companies (Commercial)

Aetna Life and Casualty
Equitable Life Insurance
Mutual of Omaha Insurance
The Travelers Insurance Company

Blue Cross/Blue Shield Organizations

Blue Cross/Blue Shield Association
Blue Cross and Blue Shield of Florida
Blue Cross and Blue Shield of South Carolina

Government Agencies

Federal Trade Commission
Health Care Financing Administration Region IV
Massachusetts Medicaid (State Rate Setting Commission)

Others

American Association of Foundations for Medical Care
American College of Anesthesiologists
Moshman Associates, Inc.
National Governor's Association (State Medicaid Center Project)

third-party payer to furnish health care services at lower than usual fees in return for prompt payment and an increased volume of patients.* We identified several FMCs which relied on versions of CRVS for constructing reimbursement schedules: The Foundation for Medical Care of Orange County (California), the San Francisco Medical Society Health Plan, and the (Jackson) Mississippi Foundation for Medical Care. Other societies or health plans across the country may base their payments on RV scales, but we failed to uncover them in our review of secondary sources.

In our empirical analyses of alternative RV scales (see Chapter I), we discussed the scale developed by Mountain Medical Affiliates (MMA) Inc., a Colorado-based preferred provider organization.** When setting procedures' unit values, MMA relied heavily on past versions of the Colorado Relative Value Committee's scale. Anecdotal information on these Colorado scales suggests their unit values were determined by judgments of committees of physicians rather than from average charge data.***

The Health Care Financing Administration (HCFA) also employs RV scales for setting some fee levels under the Medicare program. In October 1980, HCFA's Atlanta regional office directed all Medicare carriers under its jurisdiction to develop charge-based RV scales for filling in gaps in

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*U.S. Senate (1979, p. 52) and Electronic Data Systems Corp. (1984, p. 32).

**Juba (1983).

***Personal communication with Frank Traynor, chairman of a 1970 Colorado Medical Society committee charged with assisting the development of an earlier Colorado RV scale.

customary and prevailing charge screens.* This directive was a response to the consent decree signed in the preceding year by the California Medical Association prohibiting distribution of the CRVS (which, presumably, some Atlanta-region Medicare carriers had been using for gap filling). Our contact in HCFA's Atlanta regional office informed us that only two carriers, Blue Shield plans in Florida and South Carolina, had fully developed their scales as of April 1984. Tennessee's scale, being generated by Equitable Insurance, is purportedly forthcoming.

By and large, the RV scales discussed so far are charge-based. An important effort to develop an RV scale from other than charge data was undertaken by William Hsiao and William Stason of the Harvard School of Public Health.** They reported two methodologies for determining relative values based on the costs of resources used in the production of medical services. Hsiao and Stason also computed and reported resource cost-based RVs for 26 surgical and two office visit procedures frequently performed by physicians in five specialties.***

In the more important of the two approaches,**** Hsiao and Stason defined the absolute value (V) for each procedure to be the product of four input variables: $V = T * C * OC * O$, where

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*Health Care Financing Administration (October 10, 1980), Region IV, Regional Intermediary Letter Number 31-80: Local Relative Value Study.

**Hsiao and Stason (1979).

***The specialties were: general surgery, obstetrics and gynecology, ophthalmology, orthopedic surgery, and urology.

****Hsiao and Stason (1979) also reported results from a methodology using principal components analysis. In it, they weighted resource cost variables before combining them to form absolute values per procedure. However, most of their report is devoted to description and discussion of results of the multiplicative model reported here.

T = the physician's time required to perform the procedure

C = the relative complexity of the procedure as estimated by a panel of physicians

OC = an index of the amortized value of the opportunity cost of a specialist's training beyond internship

O = an index of general practitioners' overhead expenses relative to those of specialists

Hsiao and Stason contrasted their RVs to those from existing charge-based scales. Specifically, they compared their resource cost-based scale values to corresponding 1969 California Relative Value Studies values for 20 surgical procedures. They found "approximate agreement" between values on the scales in about 85 percent of those cases.* They also found "extremely close" agreement across values for nine surgical procedures on the CRVS scale, their own resource cost-based scale, and a scale based on 1978 Medicare prevailing charges from Massachusetts.**

Hsiao and Stason did report large discrepancies between charge- and cost-based scales when they evaluated the implicit worth of visits vs. surgical procedures on the two. Generally, they reported that the ratio of office visits' relative values to those of surgical procedures on the resource cost-based scale exceeded corresponding ratios from the charge-based scale. That suggested to Hsiao and Stason that office visits might be undervalued on the latter relative to surgical procedures.

The Massachusetts Rate Setting Commission (MRSC) recently adopted a version of the Hsiao-Stason cost-based RV scale for setting payments under the

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*By "approximate agreement" Hsiao and Stason mean that relative values on the CRVS are within 33 percent of corresponding values on the resource cost-based scale. See Hsiao and Stason (1979, p. 31).

**See Hsiao and Stason (1979, pp. 32-33).

state's Medicaid program. In December 1983, the MRSC implemented the new payment schedule for physicians' services. In contrast to the previous schedule, the new plan substantially increased payments for office visits while reducing or freezing reimbursements for other procedures.

The Massachusetts Commission followed a three-step procedure in developing an implicit cost-based RV scale from the Hsiao-Stason prototype. First, they split the procedures studied by Hsiao and Stason into primary care (2 procedures) and surgical (25 procedures) groups.* At the same time, the MRSC renormalized the Hsiao-Stason scale so that an office visit had a one-unit value. Next, for those same 27 procedures, the Commission computed ratios of current Medicaid payments per procedure to the current Medicaid payment for an office visit. Implicitly, that generated a Medicaid, charge-based, RV scale. In the third step, the Commission computed weighted (by service frequency) averages of ratios of those two scales' values across procedures in each of the two groups. Those two statistics revealed how much greater (or smaller) the Hsiao-Stason RVs were, on average, in contrast to relative Medicaid program payments.

The MRSC used those two weighted averages as multipliers to convert relative fees for all 2,400 Medicaid procedures to an implicit cost-based RV scale. For example, it was straightforward for the Commission to compute a series of relative Medicaid fees, using the office visit as numeraire, for all covered surgical procedures. The product of those relative charges and the surgical group's "multiplier" was an implicit cost-based RV scale. An

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*Hsiao and Stason computed two values for the procedure excision biopsy of breast--one corresponding to general surgeons, the other to gynecologists. The Commission did not recognize that distinction and based their computations on the value for general surgeons only.

analogous series of steps generated a cost-based scale for primary care procedures.

Finally, the Commission chose a dollar-per-unit conversion factor, and applied it to the implicit cost-based RV scale generating the new Medicaid fee schedule. In order to gain acceptance of the new schedule among physicians in the state, the MRSC agreed not to implement the new schedule in cases where its payments were less than the fees under the old one. Exempted from that constraint were the 27 procedures which Hsiao and Stason evaluated in their original paper. While few in number, the latter accounted for 14.4 percent of surgical expenditures, and 41 percent of primary care outlays by the Massachusetts Medicaid program during fiscal year 1980.*

Program payments under the new system were lower for 17 of the 25 surgical procedures in the Hsiao-Stason list; reductions ranged between 4 percent and 59 percent per service. Conversely, program payments for primary care procedures increased by 12 to 83 percent. The Commission plans to gradually reduce the number of exempted procedures with about 20 to 25 additional surgical procedures to be added to the at-risk list in the coming year.**

Massachusetts is not the only state whose Medicaid program attempted to manipulate patterns of payments for surgery and primary care through judicious use of a relative value scale and conversion factors. In 1976, the California Medicaid program, Medi-Cal, replaced its usual-customary-reasonable payment system with a fee schedule which uniformly applied to all practitioners in the state. Medi-Cal based that original schedule on an implicit relative charge

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*Babin and Kett (p. 11).

**Babin (1984).

scale derived from statewide average Medicaid payments per covered procedure.* Currently, the 1969 CRVS scale serves as the basis of the California fee schedule.

Medi-Cal has consistently sought to ensure access to "high priority" services (prenatal and maternity care, family planning, primary care, and child health and disability services) by setting relatively high conversion factor values for those targeted procedures.** Research suggests that, between 1976 and 1978, Medi-Cal's actions "had the desired result of increasing the participation of primary care physicians and increasing the number of Medicaid patients receiving care in physicians' offices."***

C. RV SCALES AND ANTITRUST LAWS

The physicians' services market, like most others, is subject to regulatory oversight under the Sherman and Clayton Antitrust Acts and the Federal Trade Commission Act. The primary responsibility for enforcement of those statutes rests with the Federal Trade Commission (FTC) and the Department of Justice. It is their duty to identify instances of overt price fixing and other activities which restrain trade, and to prosecute or otherwise enjoin that behavior. The enforcement agencies attempt to establish the anticompetitiveness of challenged behaviors through one of two arguments. Either the behavior in question is attacked as a violation of one

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*Holahan et al. (March 1981, p. 1).

**Harrington et al. (1983, pp. 103-105). Those targeted services are similar to the set Holahan et al. (1981) identified in their analysis of the Medi-Cal program in the years immediately following implementation of the physicians' services fee schedule.

***Holahan (1981, p. 8).

or more statutes *per se*, or the "rule of reason" dictates that the anti-competitive aspects of the activity dominate any that are procompetitive.*

Intuitively, the *per se* argument is most applicable in cases where the alleged violation of statute is clear cut. The "rule of reason" challenge is more difficult to mount, but may be applied in cases where the alleged violation is less definite.

Some regulators and health policy analysts argue that RV scales facilitate implicit price fixing or other anticompetitive behavior.** A principal argument is that a commonly held RV scale can easily be transformed into a market-area price schedule if local physicians concur on a common dollar-per-unit conversion factor. That logic is the foundation of most contemporary efforts by the FTC and the Department of Justice to halt the development and promulgation of RV scales among physicians.

The FTC was especially active during the mid-1970s when it successfully obtained consent agreements with several medical associations enjoining further development and distribution of their RV scales. (These agreements were not admissions of wrongdoing but statements that the associations would cease particular activities.) Among the specialty associations who entered into such agreements were:

the Minnesota State Medical Association (1977)
the American College of Radiology (1977)
the American College of Obstetricians and Gynecologists (1976)
the American Academy of Orthopedic Surgeons (1976)
the California Medical Association (1979)

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*Pollard (1983).

**Havighurst (1980) argues that the ease of generating a conversion factor facilitates price fixing in markets (like that for physicians, services) in which there are many vendors and in which overt collusion might be difficult to realize. He also points out that the use of RV scales to set prices facilitates price leadership and the policing of any (implicit) cartel price.

Despite such regulatory successes, the legal status of physician-sponsored RV scales is still unclear. One reason for that lack of clarity is the absence of definitive court rulings vis a vis a "rule of reason" challenge. Heretofore, federal agencies had attacked RV scales as per se violations of antitrust statutes. In an important 1979 decision, a federal court rejected a Justice Department allegation that the American Society of Anesthesiologists' scale was a per se violation of the Sherman Act. That decision thwarted further challenges via that approach. However, it is uncertain what the courts would decide if such a case were pursued under a "rule of reason" argument.*

The courts have not spelled out in detail the circumstances under which physicians may collectively set prices without fear of antitrust prosecution. In the 1982 case of Arizona vs. Maricopa County Medical Society, the U.S. Supreme Court held that it was a per se violation of antitrust law for a foundation for medical care (a loose affiliation of physicians) to set maximum fee levels. However, as Pollard (1983, p. 8) reported, that decision also established:

> . . . that competitors who have achieved sufficient operational integration by forming some sort of partnership or joint venture can jointly set prices without per se condemnation.

What remains undefined are the conditions an organization must satisfy to be considered sufficiently operationally integrated. That, plus the split (4-3)

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*Havighurst (1980) argues that "rule of reason" might be a more persuasive argument than the per se approach. He contends that RV scales inhibit the establishment of competitive market prices through their indirect effect on insurers rather than through their direct effect on physicians. By accepting a physician-developed RV scale as a basis for setting reasonable market area fees, an insurer implicitly accepts providers' preferred prices rather than those which beneficiaries prefer.

nature of the Maricopa decision leaves unclear the legality of physicians' collective price setting using an RV scale or any other method.

Although regulators frequently challenge physicians' attempts to collectively set market prices, they do not extend that challenge to third-party payers. Insurers routinely employ RV scales to fill in gaps in their customary fee screens. As a rule, regulatory agencies view the setting of maximum fees as a necessary function of third-party payers who may freely use RV scales for that purpose. What is not completely clear is the extent to which an insurer can work closely with a physicians' association in constructing an RV scale which enjoys wide public and professional distribution. An example of such cooperation is the 1982 Florida Relative Value Studies, a joint effort of the Florida Medical Association and Blue Cross and Blue Shield of Florida. This fifth version of a Florida Medical Association RV scale is based on CPT-4 terminology; unit values were derived from median 1980 physicians' charges provided, primarily, by the state's Blue Shield plan. What remains to be determined are courts' opinions on the permissible extent of insurer-physician cooperation under "rule of reason" challenges to such joint products.

Finally, it is worth noting that most of the evidence linking RV scales to anticompetitive price setting is conjectural rather than empirical. Recent empirical work by Eisenberg (1980) suggests that RV scales have not had significant effects on payments to physicians, although the scales do appear to be associated with lower levels of fee dispersion in market areas.

D. SUMMARY AND CONCLUSIONS

Our survey of contemporary RV scales revealed that most are derivatives of physicians' charges. The most widely used of all RV scales, the California Relative Value Studies, are charge-based. So, too, are many scales used by third-party payers for setting fee schedule values or for filling-in gaps in customary charge screens. The general availability of charge data, and the simplicity of computing relative fees, are reasons for the dominance of the charge-based approach to RV scale development.

The CRVS has had a particularly strong influence on aspects of medical care delivery, nationwide. This is because it has been adopted as a taxonomy by designers of other RV scales and procedure coding systems. Hence, the CRVS has affected the definition, reporting, and reimbursement of physicians' services across the country, not just in California.

Our study also uncovered examples of the less common judgment-based and cost-based relative value scales. An important example of the latter is the hybrid version of the Hsiao-Stason resource-cost-based RV scale employed by the Massachusetts Medicaid program. The fee schedule derived from that scale has been in place for less than a year, and covers only a subset of Medicaid services. Nevertheless, the Massachusetts Medicaid "experiment" will be watched closely. Over time, it should yield important data on the effects of an RVS-based fee schedule vis-a-vis program expenditures, physicians' participation rates, and other aspects of publicly sponsored medical insurance programs.

The past decade was a time of many legal challenges to the development and distribution of physicians' services RV scales. Those challenges were motivated by regulators' concerns that the scales were potential instruments of collusive price setting.

The legal status of RV scales is still cloudy. Presently, architects and promoters of RV scales do not face the same likelihood of prosecution under antitrust statute as was true in the past. This is due, in large measure, to courts' rejection of the argument that the scales were *per se* violations of statutes. However, some observers contend that effective legal challenges can still be mounted against RV scales, but it is unclear when and if such challenges will be forthcoming.

CHAPTER III

THE FINANCIAL EFFECTS OF AN RVS-BASED MEDICARE FEE SCHEDULE

David A. Juba
Margaret B. Sulvetta

In this chapter we investigate the implications of replacing Medicare's present method of paying for physicians' services with a fee schedule based on relative charges. To do so, we simulate the percentage changes in physicians' practice revenues, and in program and beneficiary costs, for a fixed set of services that would result from implementation of a prototypical fee schedule.

Under its current customary, prevailing, and reasonable (CPR) method of reimbursement, the Medicare program pays 80 percent of the reasonable charge for a service. That reasonable charge is the minimum of the billed fee, the physician's customary charge (his or her median billing for the procedure in the preceding calendar year), or the regional prevailing charge (the 75th percentile of local specialists' customary charges) for the procedure.*

If a physician accepts assignment of a Medicare claim, he or she agrees to accept the reasonable charge as payment-in-full. The Medicare program's liability is 80 percent of that value, and the beneficiary's is the remaining 20 percent.** If the physician rejects assignment, the beneficiary is liable for the entire amount of the bill, but can collect 80 percent of the

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*Annual increases in region- and specialty-specific prevailing charges are constrained not to exceed limits set by a nationwide Medicare Economic Index. See Paringer (1981).

**After fulfillment of the deductible.

reasonable fee from the Medicare program. Physicians must accept assignment of claims of patients who are jointly eligible for Medicare and Medicaid coverage. For those beneficiaries, the state's Medicaid program pays the 20 percent Medicare coinsurance.

In this chapter, we simulate the fiscal effects of replacing Medicare reasonable charges with a fee schedule. Specifically, we examine the effects of that action on the medical practices of a sample of California physicians who treated Medicare patients during the first quarter of 1978.

A. DATA

Our sample includes 3,212 California physicians in solo or single-specialty group practice. Among them are members of five specialties: 1,129 general practitioners, 965 internists, 625 general surgeons, 255 orthopedic surgeons, and 238 ophthalmologists. For sampled physicians, the state's two Medicare carriers (Occidential Insurance and Blue Shield of California) provided price and volume data on each of 470 frequently performed procedures.* Included were each physician's average Medicare billings and the volume of service to Medicare beneficiaries in different assignment categories during the first quarter of 1978. From the carriers, we also obtained customary and prevailing charges and volume data for the 470 procedures for every certified Medicare provider in California in 1980.

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*These account for over 95 percent of physicians' services received by Medicare beneficiaries.

B. FEE SCHEDULE CONSTRUCTION

From the 1980 fee and volume data for all Medicare providers in the state, we construct weighted average fees (FS_i) for each procedure (i) as follows:*

$$FS_i = \sum_j (AR_{ij} * NS_{ij}) / \sum_j NS_{ij}$$

where

AR_{ij} = the average reasonable fee for the i^{th} procedure charged by the j^{th} physician in the state

= min (customary fee_{ij}, indexed prevailing $charge_j$)

NS_{ij} = number of services for the i^{th} procedure provided by the j^{th} physician in the state.

The construction of an RV scale-based fee schedule from those averages usually requires two additional steps. Given mean charges, we would select a numeraire procedure and compute ratios (relative values) of each procedure's mean charge to the numeraire's. Next, we would choose one or more dollar-per-RV-unit conversion factors to transform the RV scale into a fee schedule. For simplicity, we presume the existence of an implicit numeraire with average charge of $1.00, and employ a $1.00 per-RV-unit conversion factor applicable

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*These service counts include services to Medicare, Medicaid, CHAMPUS, and Blue Shield private business. Medicare includes all such services in setting its profiles. If Medicare services alone were used as the weight in calculating average reasonable fees, any program savings which would otherwise appear might be eliminated. The program savings which appear here as the result of implementing the fee schedule may reflect the substantial weight given to low-priced Medicaid doctors when all claims are included in calculating fee schedule values.

to all procedures under study. Hence, in our simulations, the sets of weighted average charges, relative values, and the fee schedule are identical.

C. SIMULATION METHODS

We compute first quarter 1978 Medicare program expenditures (PE), practice revenues (PR), and beneficiaries' liabilities (PL) for each sampled physician under the present CPR reimbursement system as follows:*

Current Program Expenditures

$$PE = (.8(AAA^{80}_{na}) * NS^{78}_{na}) + .8(AAA^{80}_{va}) * NS^{78}_{va})$$
$$+ (.8(AAA^{80}_{ma}) * NS^{78}_{ma})$$

---

*We adjusted 1978 billings to conform to 1980 customary and prevailing fees for the purpose of computing revenues and liabilities:

Let ABA^{80} be the estimated 1980 average billed amount, and ABA^{78} its 1978 counterpart:

$$ABA^{80} = ((LVI^{80}/LVI^{78})/(ADJFEE_{76-78})) * ADJFEE_{78-80} * ABA^{78}$$

where LVI^{80} and LVI^{78} are customary fees for 1980 and 1978, respectively, and $ADJFEE_{76-78}$ and $ADJFEE_{78-80}$ reflect changes in the California physicians' fee index between 1976 and 1978, and 1978 and 1980, respectively. ADJFEE is calculated separately for each procedure type.

	$ADJFEE_{76-78}$	$ADJFEE_{78-80}$
Medical Services	1.1426	1.2014
Surgery	1.1346	1.1734
Radiology	1.1047	1.2122
Pathology	1.1044	1.1553

1980 average allowed amounts were then calculated for each physician/procedure/claim type as min (LVI^{80}, $LVII^{80}$, ABA^{80}) where $LVII^{80}$ is the 1980 prevailing fee, LVI^{80} and ABA^{80} are as previously defined.

Current Revenue

$$PR = (ABA_{na}^{80} * NS_{na}^{78}) + (AAA_{va}^{80} * NS_{va}^{78}) + (AAA_{ma}^{80} * NS_{ma}^{78})$$

Current Patient Liabilities

$$PL = (ABA_{na}^{80} - .8(AAA_{na}^{80})) * NS_{na}^{78} + .2((AAA_{va}^{80} * NS_{va}^{78}) + (AAA_{ma}^{80} * NS_{ma}^{78}))$$

where: ABA^t = average billed amount in year t
AAA^t = average allowed amount in year t
NS^t = number of services in year t
na = nonassigned services
va = voluntary assigned services
ma = mandatory assigned services
mt = total Medicare services

In an analogous fashion, we compute expenditures, revenues, and liabilities under the fee schedule by replacing average CPR allowed charges (AAA) with fee schedule values (FS) in the preceding algorithms. We then aggregate those values over physicians in each particular specialty and over the entire sample.

In the following section, we report statewide expenditures, revenues, and liabilities for the same services under CPR reimbursement and the simulated fee schedule. In both options, we assume voluntary assignment of non-poor patients' claims, 20 percent cost-sharing by beneficiaries, and mandatory assignment of claims of joint Medicare-Medicaid eligible patients.

D. RESULTS

In Table III-1, we observe that aggregate practice revenues are not appreciably different under reimbursements determined via fee schedule or the present CPR approach. For most specialties, the replacement of CPR with the fee schedule results in small (less than 1 percent) reductions in total Medicare related revenues. However, the effects on revenues of internists and general practitioners were somewhat greater. Internists revenues are 1.64 percent lower under the fee schedule than under CPR, while revenues of the general practitioners in the sample are 0.65 percent greater.

While aggregate revenues of sampled physicians are not much different under the two alternative reimbursement plans, the same cannot be said of individual physician's revenues. That assertion is supported by the data of Table III-2, distributions of physicians in terms of percentage differences in practice revenues under CPR and fee schedule-based Medicare reimbursement.

A noteworthy attribute of those distributions is their tightness around zero. Upwards of 84 percent of the practitioners in each specialty experience simulated changes in revenues of 5 percent or less. While the distributions tend to be massed around zero, they are not symmetric. Rather, they are skewed in one or the other direction implying that more (or fewer) physicians in the specialty gain revenues than lose them in the simulations. For approximately 37 percent of all physicians, practice revenues are greater under the fee schedule, while for 34 percent revenues are greater under the CPR system.

Different symmetry patterns hold for different specialties. The proportion of general practitioners who have greater revenues under the fee schedule is approximately twice the fraction who have greater revenues under CPR (50.7 vs. 21.4 percent, respectively). Likewise, the distribution of

Table III-1

Physician Revenues, Program Expenditures, and Patient Liability
Under CPR System and Statewide Fee Schedule
Medicare Total

Specialty/Procedure	Total No. MDs	Current MD Revenue	Fee Schedule MD Revenue	Percent Change Revenue	Current Program Expenditure	Fee Schedule Expenditure	Percent Change Expenditure	Current Patient Liability	Fee Schedule Patient Liability	Percent Change Liability
Total Five Specialties										
All Procedures	3212	$40016026	$39707528	-0.77	$27199350	$26575619	-2.29	$12816679	13131908	2.46
General Practice										
All Procedures	1129	8568352	8623920	0.65	5909506	5989603	1.36	2658846	2634316	-0.92
General Surgery										
All Procedures	625	4915400	4885333	-0.61	3359308	3313058	-1.38	1556091	1572274	1.04
Internal Medicine										
All Procedures	965	18529072	18225152	-1.64	12509664	11932524	-4.61	6019413	6292629	4.54
Orthopedic Surgery										
All Procedures	255	4185166	4162533	-0.54	2811096	2750818	-2.14	1374069	1411715	2.74
Ophthalmology										
All Procedures	238	3818036	3810590	-0.20	2609776	2589616	-0.77	1208260	1220974	1.05

Table III-2

Distribution of Physicians by Percentage Change in Program Revenues
Resulting from Implementation of a Statewide Fee Schedule
Medicare Total

Specialty/Procedure	Total No. MDs	< -50%	-50% to -26%	-25% to -11%	-10% to -6%	-5% to -1%	0%	1% to 5%	6% to 10%	11% to 25%	26% to 50%	> 50%	Revenues per MD	Avg. Change in Revenues per MD
Total Five Specialties														
All Procedures	3212	0.00	0.03	2.86	4.76	26.06	29.02	31.07	4.48	1.65	0.06	0.00	$12362.24	$-96.05
General Practice														
All Procedures	1129	0.00	0.00	1.42	2.57	17.36	27.99	41.98	5.85	2.66	0.18	0.00	7638.55	49.22
General Surgery														
All Procedures	625	0.00	0.00	2.72	4.80	27.68	29.60	27.68	5.28	2.24	0.00	0.00	7816.53	-48.11
Internal Medicine														
All Procedures	965	0.00	0.10	5.08	6.94	36.06	27.46	22.28	1.76	0.31	0.00	0.00	18886.17	-314.94
Orthopedic Surgery														
All Procedures	255	0.00	0.00	2.35	8.24	29.41	29.02	25.88	3.53	1.57	0.00	0.00	16323.66	-88.76
Ophthalmology														
All Procedures	238	0.00	0.00	1.68	2.52	18.91	38.66	29.41	7.98	0.84	0.00	0.00	16010.88	-31.29

opthalmologists is slightly skewed in the direction of greater revenues under the fee schedule. The converse holds for internists and orthopedic surgeons. Proportionately more of those specialists lose practice revenues than gain them in the simulations. The distribution of general surgeons is somewhat more symmetric; roughly the same fraction, 35 percent, of those practitioners experience increases (decreases) in revenues when the fee schedule supplants CPR reimbursement.

The magnitude of changes in revenues is evident from data in Table III-2. Internists experience the largest simulated decline ($315) in practice revenues. That figure is nearly three times as large as the average decline ($96) across all physicians. Finally, among all specialties, only general practitioners experience an increase in practice revenues ($49) when the fee schedule replaces traditional reimbursement methods.

Our second area of inquiry is the effect of the fee schedule on the level of Medicare program payments to physicians. Table III-1 shows the direction of these effects to be identical to the direction of the corresponding effects on practice revenues. However, magnitudes do differ between the two sets of simulated results; percentage changes in program payments generally exceed corresponding percentage changes in practice revenues. Furthermore, simulated percentage changes in program payments vary with providers' specialty. When we replace CPR reimbursement with the fee schedule, Medicare's payments to all physicians decline by 2.29 percent. That overall "savings" rate is a combination of the different rates corresponding to the five specialties in the sample. Those specialty-specific savings rates range from the 4.61 percent savings in program payments to internists to the 1.36 percent increase in payments to general practitioners.

It is also useful to determine the extent to which imposition of a fee schedule reduces (or increases) program payments, uniformly, across all services performed by members of particular specialties. The data of Table III-3 are useful for investigating that question. They show that program payments under the fee schedule are less than payments under the CPR system for approximately 56 percent of the services provided by physicians in the sample. They also reveal that program payments under CPR are greater than payments under the fee schedule for about 40 percent, and for 4.71 percent of those services there is no difference in payments under the two reimbursement methods.

Approximately 61 percent of general practitioners' services are more costly to the Medicare program under the fee schedule, while about 34 percent cost less, and only 4.56 percent require the same level of program payments under the two reimbursement plans. A different pattern holds for services of general surgeons, internists, and orthopedic surgeons. The fractions of services (54 to 67 percent) that are less costly to the program under the fee schedule exceeds the fractions (27 to 42 percent) which are more costly.

Also of interest are the average changes in cost per service reported in Table III-3. For all procedures, imposition of the fee schedule reduces average program cost per service by $0.57. Across particular specialties, only services provided by general practitioners cost the Medicare program more ($0.23), on average, under the fee schedule than under CPR reimbursement.

In a third set of simulations, we examine the effects of the fee schedule on beneficiaries' liabilities. In Table III-1, we reported that the overall effect of the fee schedule on Medicare patients is to increase their out-of-pocket costs by 2.46 percent. As was true in the other simulations, those effects vary with providers' specialty. Again referring to Table III-1, we find that the effects of the fee schedule on beneficiaries ranged from the

Table III-3

Distribution of Services by Percentage Change in Program Expenditures
Resulting from Implementation of a Statewide Fee Schedule
Medicare Total

Specialty/Procedure	Total Number Services	< -50%	-50% to -26%	-25% to -11%	-10% to -6%	-5% to -1%	0%	1% to 5%	6% to 10%	11% to 25%	26% to 50%	> 50%	Program Costs Per Service	Avg. Change in Costs per Service
Total Five Specialties														
All Procedures	1356044	0.00	0.01	12.67	19.16	23.93	4.71	24.29	10.87	4.34	0.02	0.00	$19.60	$-0.57
General Practice														
All Procedures	427626	0.00	0.00	3.51	10.94	19.53	4.56	37.13	16.96	7.29	0.06	0.00	14.00	0.23
General Surgery														
All Procedures	87952	0.00	0.00	13.24	12.48	28.36	3.58	25.11	9.42	7.82	0.00	0.00	37.67	-0.66
Internal Medicine														
All Procedures	720992	0.00	0.01	18.02	24.92	25.93	4.58	17.33	7.06	2.14	0.00	0.00	16.55	-1.00
Orthopedic Surgery														
All Procedures	61227	0.00	0.00	14.30	21.99	30.05	4.67	14.95	12.06	1.93	0.05	0.00	44.93	-1.23
Ophthalmology														
All Procedures	58247	0.00	0.00	11.13	15.14	18.34	9.06	24.78	14.30	7.25	0.00	0.00	44.46	-0.43

4.54 percent increase in their payments to internists to the 0.92 percent reduction in their payments to general practitioners.

As before, we are interested in the distribution of beneficiaries according to the percentage change in their out-of-pocket costs. In Table III-4, we observe that the distribution of all beneficiaries independent of providers' specialty is essentially symmetric about zero. Implicitly, the fraction of Medicare patients experiencing a particular percentage savings is balanced by approximately the same fraction experiencing equivalent simulated increases in out-of-pocket payments. That same rough symmetry around zero holds for distributions of general surgeons' and opthalmologists' patients. On the other hand, proportionately more of internists' and orthopedic surgeons' patients have their out-of-pocket costs increased than have them decreased via replacement of CPR with the fee schedule. The opposite is true of general practitioners' patients.

The relative tightness of the distributions of general surgeons' and opthalmologists' patients helps explain the small average changes in their out-of-pocket costs when the fee schedule replaces CPR reimbursement. For all beneficiaries, out-of-pocket costs are $0.91 greater, on average, under the fee schedule than under CPR. The smallest increases per patient ($0.33 and $0.47) are associated with opthalmologists' and general surgeons' patients. The greatest increases ($1.90 and $1.84 per patient) are associated with beneficiaries treated by internists and orthopedic surgeons. Average liabilities of general practitioners' patients are $0.23 lower under the fee schedule than under Medicare's present reimbursement system.

E. CONCLUSIONS

The initial effects of the proposed fee schedule are small. Aggregate program and beneficiaries' payments and practice revenues rarely differed from

Table III-4

Distribution of Patients by Percentage Change in Patient Liabilities
Resulting from Implementation of a Statewide Fee Schedule
Medicare Total

Specialty/Procedure	Total Number Patients	< -50%	-50% to -26%	-25% to -11%	-10% to -6%	-5% to -1%	0%	1% to 5%	6% to 10%	11% to 25%	26% to 50%	> 50%	Liability Per Patient	Avg. Change Liability per Patient
Total Five Specialties														
All Procedures	345849	0.00	0.38	8.13	13.47	21.84	6.55	24.49	15.43	9.31	0.40	0.00	$37.96	$0.91
General Practice														
All Procedures	108067	0.00	0.48	8.46	16.68	30.79	9.31	23.17	8.62	2.39	0.11	0.00	24.35	-0.23
General Surgery														
All Procedures	34597	0.00	0.41	10.46	12.28	25.24	7.74	24.05	8.21	11.32	0.29	0.00	45.44	0.47
Internal Medicine														
All Procedures	144173	0.00	0.10	6.42	10.10	15.99	4.14	27.19	22.74	12.94	0.37	0.00	43.65	1.90
Orthopedic Surgery														
All Procedures	20477	0.00	0.48	6.32	12.72	16.67	3.55	27.99	17.93	13.47	0.86	0.00	68.94	1.84
Ophthalmology														
All Procedures	38535	0.00	1.03	12.50	18.51	18.34	8.37	16.61	12.34	11.13	1.17	0.00	31.68	0.33

their present values by more than 3 percent. Yet, a belief that payment via fee schedule will not generate fundamentally different outcomes from payment under CPR may help make the former an acceptable policy alternative to all concerned parties.

Even though the fiscal effects of the proposed fee schedule are not large initially, they could be significant in the future. Essentially, the proposed average-charge-based fee schedule represents a schedule of relative payments. Under traditional CPR reimbursement, future payments for Medicare services are a function of growth in physicians' billings over time. That need not be the case for reimbursements under the fee schedule. For instance, the initial schedule of relative fees could be updated via negotiation between the Medicare program and physicians. Under that scenario, annual rates of increase in all or part of the fee schedule need not match corresponding annual increases under an alternative CPR payment scheme. Breaking the explicit link between rates of inflation in physicians' billings and rates of inflation in Medicare allowed payments could go a long way toward reducing the rate of growth in the program's payments to physicians and other providers of medical services.*

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*For evidence from Canada, see Hadley, Holahan, and Scanlon, (1979), pp. 253-255.

CHAPTER IV

THE EFFECTS OF HEALTH INSURANCE ON ABSOLUTE AND RELATIVE PRICES OF PHYSICIANS' SERVICES

David Juba

A. INTRODUCTION

Recently, annual rates of increase in physicians' fees have exceeded the rate of general price inflation across the country. This has had grave consequences for Medicare's part-B physicians' expense insurance program.* These fee increases, coupled with increased utilization of services by Medicare beneficiaries, spawned substantial growth in Federal liabilities under that program. In an effort to control these spiralling expenditures, the Health Care Financing Administration is studying alternative reimbursement methods, including payment according to fee schedules.

A fee schedule is a set of fixed maximum payments for medical procedures. In contrast, payments under Medicare's present customary, prevailing, and reasonable (CPR) reimbursement system can take one of several values. For a given service, Medicare pays a reasonable fee set at the minimum of a physician's billed charge, his or her customary or median fee, or the prevailing charge among peer physicians in the area. Under that system, inflation in physicians' billings leads to inflation in Medicare reasonable fees after a short time lag, making it difficult for the government to control growth in part-B expenditures.

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*Between 1975 and 1980, the physicians' services component of the CPI increased 59.0 percent while the overall CPI grew by 52.1 percent. (Statistical Abstract of the United States, 1982-83, p. 462). Over the same five years, Federal outlays under Medicare part B for physicians' services increased by 131.3 percent (Health Care Financing Review, Summer 1983, p. 117).

Many private insurers employ a similar charge based system for setting physicians' reimbursements, called the UCR approach. As competitive pressures force private carriers to find ways of controlling increases in premiums, they too will reexamine their reimbursement methods.

Setting payments according to a fixed fee schedule is one approach open to insurers intent upon controlling their liabilities. Among the alternative fee schedule construction methods is an approach based on relative values of physicians' services. These relative values, RVs, are cardinal measures of each procedure's "worth" relative to some baseline or numeraire service. While not a fee schedule per se, the set of RVs is easily transformed into one. Insurers need only establish a price per RV unit; the fee schedule follows immediately as the product of that unit price and the number of RV units associated with each procedure.

The analysis reported in Chapter I developed and contrasted alternative, charge based, RV scales. It showed them to be essentially invariant with respect to geographic and temporal differences in the underlying data, and with respect to the point on regional distributions of charges chosen to be the representative fee for each procedure.

Consistency in valuing medical procedures is insufficient justification for basing fee schedules on charge based RV scales. The scales' other properties need examination, including the extent to which they are distorted by different phenomena including variation in health insurance coverage. It is well known that health insurance breaks the link between market prices for medical services and their true worth to consumers. If price levels are affected by health insurance, then so might the corresponding relative values.

This study explores the relationship between health insurance and prices of physicians' services, both in level terms and relative to a numeraire. If it establishes relative prices to be essentially invariant with respect to shifts in insurance coverage, it strengthens the case for constructing fee schedules from charge based RV scales.

B. MODEL: THE MARKET FOR PHYSICIANS' SERVICES

Central to this investigation are a series of empirically estimated price level and relative fee equations. Equations in both classes are derivatives of a simple demand and supply model of the physicians' service market.

In this model, the supply of physicians' services (Q_s) is a function of market price (P) and exogenous variables (X_s) including cost of inputs to production; supply is also determined by the availability of physicians (MD) in a region. This study treats MD as endogenous, permitting migration of physicians in response to regional fee differentials.

Demand for physicians' services (Q_d) is determined by prices and by exogenous factors (X_d) including population characteristics known to correlate with the underlying regional need for medical care. Demand also varies with individuals' ability to pay, health insurance coverage (I_d) being an important determinant of that ability.* Presuming that prices equilibrate supply and demand in each market, the complete model is:

(1) Q_s = supplies of physicians' services = $s(P, MD; X_s)$

(2) Q_d = demand for physicians' services = $d(P; I_d, X_d)$

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*If there is a simultaneous relationship between health insurance and health care prices, it is most likely between insurance and hospital costs. In the recent past (Waldo, 1980) national expenditures on hospital services accounted for 40 percent of national health expenditures, while physicians' expenses were approximately 19 percent. Given the dominance of the hospital share of expenditures, it is likely that hospital costs, more than physicians' fees, drive purchases of health insurance. Evidence presented by Feldstein (1973) provides statistical verification of the link between demand for health insurance and hospital prices.

(3) MD = availability of physicians = $a(P; X_a)$

(4) $Q_s = Q_d$ market equilibrium condition

Solving the model represented by these equations shows price to be a function of all exogenous demand and supply variables, including health insurance, and regional availability of physicians' services.

Health insurance may differentially affect procedures' prices since both coverage levels and the sensitivity of price to insurance may vary by procedure. These effects are embodied in the following general specification for a physicians' fee equation. Let the price (P_k) of the k^{th} procedure be a function of only two variables, insurance coverage (I_k) and a composite measure (X) of all other factors:*

$$(5) \quad P_k = I_k^{b_k} \cdot X^{c_k}$$

In this specification, the effect of insurance on price depends on the level of insurance coverage and the responsiveness or elasticity (b_k) of price to that coverage.** Both factors may vary by procedures in a particular region.

The k^{th} procedure's price relative to a baseline or numeraire is expressable as:

$$(6) \quad P'_k = P_k/P_n = (I_k^{b_k}/I_n^{b_n}) \cdot (X^{c_k}/X^{c_n})$$

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*In the empirical analyses of this study, demand and supply variables are measured at the state level and are invariant with respect to medical procedure. For that reason, the composite variable is not subscripted.

**The elasticity (b_k) of the k^{th} procedure's price with respect to health insurance is the percent change in price associated with a percent change in insurance coverage. Formally, elasticity (b_k) is defined as: $(\partial P_k/\partial I) \cdot (I/P_k)$.

The relative price P'_k is independent of insurance distortions to the extent that the total insurance effects on both constituent procedures, $I_k^{b_k}$ and $I_n^{b_n}$, are equal.

Ideally, empirical health insurance variables ought to be specific to each procedure. However data limitations precluded the use of such measures in this study; instead it employed state-wide procedure-invariant health insurance variables (I). Substituting such a variable for the procedure-specific coverage measure yields a relative price equation:*

$$(7) \quad P'_k = P_k/P_n = (I^{e_k}/I^{e_n}) \cdot (X^{c_k}/X^{c_n}) = I^{(e_k - e_n)} \cdot X^{(c_k - c_n)}$$

In this modified specification, relative prices will be free of insurance distortion if the difference between elasticities of the procedure of interest and numeraire $(e_k - e_n)$ is approximately zero. Conversely, given a positive level of gross health insurance coverage in a region, a significant insurance effect on the k^{th} procedure's relative price requires $(e_k - e_n)$ to be non-zero.

The foregoing suggests a two step approach for assessing whether insurance distorts relative fees. In the first step, the study estimates parameters of price level equations using state average 1978 Medicare prevailing fees serving as dependent variables.** Inspection of insurance

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*The elasticity of price with respect to procedure-invariant health insurance (e_k) is actually a composite of two other parameters; the responsiveness of price to procedure-specific health insurance (the b_k of equation (6)) and the elasticity of procedure-specific coverage to a change in procedure-invariant insurance. Further details are provided in Appendix 1.

**Medicare reimburses physicians the lesser of the billed charge or the customary, prevailing, or reasonable fee for each service. Physician-specific customary fees are the median fees charged by the physician for the procedure during the calendar year (1976) immediately preceding the fee screen year (July 1977 to June 1978). Prevailing fees are the 75th percentile of the distribution of customary fees for the procedure across all physicians in a defined region. The criteria of reasonability is employed to justify payment of a greater fee under extraordinary circumstances.

elasticities in these price level equations reveals the potential for insurance distortion of relative fees. As equations (7) shows, that distortion is embodied in the difference between insurance elasticities of price levels of selected procedures and the numeraire. Under the null hypothesis, insurance elasticities of price are invariant across procedures; therefore, differences between them will be zero. In the second step, the study estimates the magnitude and statistical significance of these differences. Findings supportive of the null hypothesis that the (e_k-e_n) are not statistically different from zero would be evidence that relative prices are not distorted much by health insurance.

C. THE HEALTH INSURANCE INDUSTRY: AN OVERVIEW

As stated, the Medicare prevailing fees at the core of the price equations are for fee screen year 1978. These, in turn, were constructed by Medicare intermediaries from billings submitted by physicians during calendar year 1976. Consequently, an understanding of the way health insurance could effect these fees requires an understanding of the U.S. health insurance industry as it existed during the mid-1970s.

For the past two decades, physicians' expense insurance as well as coverage for hospital and surgical expenses in the U.S. has been provided by government sponsored Medicare and Medicaid programs and by private insurers. During that time, private carriers provided the greater share of physicians' expense coverage, nationwide. For example, in 1975, private health plans paid 38.8 percent of all expenditures on physicians' services, government paid 26.3 percent (13.4 percent paid by Medicare), with the remainder paid directly by individuals.*

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*Gibson (1980), p. 30, Table 6.

During the 1970s, certain types of health insurance grew in popularity relatively faster than others. Among the former were physicians' expense coverage and major medical expense insurance. First introduced by commercial insurers in the early 1950s, major medical expense insurance provided comprehensive protection against the most serious and costly injuries and illnesses. By the mid 1970s, this type of protection had remained essentially the province of commercial carriers who offered it both as a comprehensive policy and as a supplement to any insurers' basic medical expense coverage.*

Between 1970 and 1975, the U.S. population with physicians' expense coverage increased in numbers by 17.6 percent; the population with major medical insurance increased 30.4 percent over the same period. In contrast, growth in the populations covered by hospital and surgical expense insurance grew by 11.2 percent and 10.6 percent, respectively.** These data suggest that increases in aggregate outlays on health insurance premiums during the past decade are a direct result of expansion in physicians' expense and major medical expense insurance.

The methods insurers used to pay for physicians' services also changed during the 1970s. In particular, traditional indemnity payments based on fee schedules gave way to more generous charge based reimbursement. Blue Shield plans, especially, adopted the latter approach, often called usual-customary-reasonable reimbursement. Under UCR, the insurer pays the lesser of a physician's billings, that provider's usual charge, or the fee customarily

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*Data in Table 1.5 of the Source Book of Health Insurance, 1981-1982 (Health Insurance Association of America) imply that approximately 70 percent of persons in the U.S. with major medical insurance in 1976 had such coverage through commercial carriers.

**Derived from data in Health Insurance Institute, Source Book of Health Insurance, 1981-1982, pp. 7-17.

charged by peer physicians in the region. When compared to fee schedule payment limits, maximum allowable reimbursements under a UCR plan are generally greater.* However, indemnity benefits tend to be "first dollar" coverage, while deductibles and other copayments are common elements of UCR reimbursement.

While the Blues frequently set payments for physicians' services via UCR methods, commercial carriers primarily relied on fee schedules for that purpose. However, the for-profit carriers generally employed UCR methods in their major medical plans which supplemented much of the basic insurance underwritten by them.**

D. EMPIRICAL ANALYSIS

This section develops and estimates parameters of price level and relative fee equations. The unit of analysis is the state; the period of study is the single year 1978. Descriptions of empirical price measures, demand, supply, and insurance variables follow immediately, with empirical results after them.

1. Prices

The dependent variables in the analyses are state average prevailing fees and fee ratios for fifty medical procedures that physicians frequently provide

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*See Dyckman (1978) pp. 23-33 for a complete discussion of UCR reimbursement during the 1970s. He reported (p. 22) that 14 of 33 million contracts, 41.7 percent, written by Blue Shield plans in force in 1976 had UCR provisions. He surveyed nine major commercial and nonprofit carriers and reported, among other findings, that fees under a payment schedule were almost always below those paid under UCR.

**Dyckman (1978) reported anecdotal evidence from one large commercial carrier to the effect that over 95 percent of its basic insurance plans utilizing fee schedules also included major medical coverage supplementing the basic plan.

to Medicare beneficiaries. Among them are hospital and office visits, an array of surgical procedures, and commonly billed ancillary services. The state-average fees are population-weighted means of county level Medicare prevailing charges for 1978.* All monetary variables in the analyses, including average fees, are in real terms, having been deflated by a state cost of living index.**

2. Demand and Supply Variables

Among the explanatory demand variables in the price equations are the median years of post-high school education achieved by state residents (EDUC), and the fraction of the state's population age 65 or older (PCT65).*** Aggregate data reveal health status to be positively correlated with schooling; the greater the educational attainment, the fewer days lost per year due to illness.**** With demand for physicians' services implicitly lower among the more educated population groups, fees should be lower in states where average educational attainment (EDUC) is greatest. Conversely, the elderly are

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*Area Resource File as of July 1982; Department of Health and Human Services, Division of Health Professions Analysis. File data on 1978 prevailing fees are the 75th percentile charge for each of fifty procedures for General Practicioners and for Specialists. Most Prevailing Charges localities follow county boundaries and encompass one or more counties.

**Details of the construction of the cost-of-living deflator are available from the author. In brief, an index of family budgets for metropolitan areas was regressed against a set of predictor variables. From the estimated equation, the author created a series of predicted county-level cost-of-living indexes, then averaged them within states to obtain the state deflator.

***Data for both variables are from the State and Metropolitan Area Data Book, 1979; U. S. Department of the Census, Bureau of Labor Statistics.

****Educational attainment varies inversely with such morbidity statistics as days of restricted activity, bed disability, and work loss. See Table 6.3 in Health Insurance Institute, Source Book of Health Insurance Data, 1978-1979.

expected to have greater need for medical services than members of other age groups. Given extensive participation of the elderly in the Medicare part B program, their greater need is translated via insurance into effective demand. Upward pressure on physicians' fees is the result, ceteris paribus.

Regression analyses not reported here included state-average household income as an explanatory variable. That variable was highly correlated with measures of health insurance; hence, both could not appear in the same price equation without greatly reducing the statistical significance of the estimated insurance effect.* Price equations are still well-specified in the absense of the houshold income variable, since income affects medical prices primarily through the purchase of health insurance. Including several measures of health insurance coverage in the price equation obviates the need for an explicit income variable.

Regional supplies of medical services at a given market price are determined by local availability of physicians and the cost of medical practice inputs. Unfortunately, reliable data on state average practice costs are not readily available. The omission of an input cost explanatory variable in the fee regressions is not serious if the former varies directly with the study's cost-of-living index. If so, deflating state average physicians' charges by that index removes much of the variation in charges attributable to inter-state differences in the costs of operating a medical practice.

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*The first order correlation between deflated income per household and premiums per covered population in states was .56. In OLS regressions of real premiums per capita against real household income and other explanatory variables, the income elasticity of insurance was .67 and was statistically significant at the .01 percent level.

3. Physician Availability

Medicare carriers compute prevailing fees from billings submitted by physicians in the medical specialty most likely to perform a given procedure. Consequently, the dependent variables in the regressions are average prices charged by physicians in a particular specialty. Those equations include physicians per population (DOCSPOP) among the explanatory variables; by construction, DOCSPOP also corresponds to the specialty most likely to perform each procedure.*

In the market model, physicians per capita is endogenous, being jointly determined with average prevailing fees. To permit unbiased estimation of fee equation parameters, the analysis employs, as an instrument, the value of DOCSPOP predicted from a regression of physicians per capita against exogenous demand and supply variables.**

Physicians per capita should be negatively associated with average prevailing fees in a state. Greater availability of physicians in a region translates into greater supplies of their services. All else equal, the market clearing price should be lower in states with greater supplies and conversely when supplies are taut.

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*Depending upon the procedure, physicians per capita are non-federal, patient care, Cardiologists, Internists, Gynecologists, Neurologists, Radiologists, General Surgeons, or Urologists. Physicians in counties in 1975 were aggregated, yielding state totals. Source: Area Resource File as of July 1982; Department of Health and Human Services, Division of Health Professions Analysis.

**In the first stage regression, specialists per capita in states were regressed against the following dependent variables: short term hospital beds per capita, median household income in the state, median years of education of state residents, percent female population, and percent elderly population in the state, and percent of the population living in metro areas. Two insurance variables were also included, real premiums per insured resident, and a measure of commercial insurers' market share.

4. Measures of Health Insurance

The previous discussion of the insurance industry identified two important characteristics; the extent of insurance protection held by the covered population, and the relative share of the private market controlled by commercial carriers. As reported, populations with physicians´ expense or major medical coverage have increased much more rapidly over the past decade than populations with basic health care coverage--hospital and surgical expense insurance. That trend suggests regional variations in purchases of health insurance are reflective of differences in coverage beyond basic protection. The overview also highlighted important differences between the basic physicians´ expense insurance offered by Blue Shield and commercial carriers. Especially important were differences in payment mechanisms. Consequently, a measure of the share of a health insurance market held by commerical carriers will permit empirical estimation of any relationship between those differences and fee levels.

Two health insurance variables appear in each regression equation.* The first is deflated premiums per individual covered by private health insurance in a state (PREMCOV). A priori, that variable should be positively related to state average fee levels. This follows from the premise that interstate variations in premiums are positively correlated with variations in coverage beyond basic hospital and surgical expense insurance. The greater the average premiums per person, the greater the coverage and demand for physicians´ services. Assuming unchanged market supply schedules, greater demand results in higher market price levels.

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*See Appendix IV-2 for details on the construction of these variables as well as descriptions and sources of the underlying charge and population data.

The overview of the health insurance industry reported several differences between the payment methods and coverages offered by commercial and Blue Shield plans. The second insurance variable (PCTCINS) is the proportion of health insurance premiums in the state paid to commercial carriers. Its expected effects on physicians' fees are unclear, however, because structural elements of both commercial and Blue Shield coverage could have contributed to fee inflation. To the extent that greater commercial insurers' market share implies greater use of indemnity fees schedules in contrast to Blue Shield UCR methods, the inflationary effect of PCTCINS might be small. In contrast, if that variable is a proxy for extensive commercially sponsored major medical coverage (reimbursed using UCR methods) then the coefficient on PCTCINS will be positive and significant. Hence, the effects of that variable on physicians' fees must be determined empirically.

E. EMPIRICAL RESULTS: PRICE LEVEL EQUATIONS

Using least squares regression techniques and the state level data base, the study estimated coefficients of fifty price level equations; one for each of the medical procedures under investigation. This section summarizes these results, paying particular attention to coefficients of PREMCOV and PCTCINS, the health insurance variables. (Complete sets of coefficients and standard errors for the fifty equations appear in Appendix IV-3).

Equation (8) is the empirical analog of the general price equation (5) specified in the modelling section. The coefficients b_{4k} and b_{5k} in the empirical version correspond to the insurance elasticity (b_k) of the generic equation.

$$(8) \quad \ln(P_k) = b_{ok} + b_{1k}\ln(EDUC) + b_{2k}\ln(PCT65) + b_{3k}\ln(DOCSPOP) + b_{4k}\ln(PREMCOV) + b_{5k}\ln(PCTCINS)$$

Recall that data limitations precluded specification of procedure-specific health insurance variables. Consequently, different insurance effects on procedures' prices within a state are completely defined by differences in estimated insurance elasticities of price (the coefficients on insurance variables in the price equations). If the elasticity of price with respect to a particular insurance variable is nearly constant across the fifty procedures, the hypothesis of a uniform insurance effect is supported. In Table IV-1 are means of these elasticities computed over all procedures in each of four classes; surgery, medical visits, radiology, and ancillary services.

Table IV-1

Insurance Elasticities
Mean Values for Classes of Procedures
(Price Level Equations)

Name	Class Size	Mean Coefficients (Elasticities) of Insurance Variables: PREMCOV	PCTCINS
Surgery	22	.274	.276
Visits	08	.339	.231
Radiology	07	.313	.455
Ancillaries	13	.236	.254
All Procedures	50	.280	.288

In Table IV-1, the mean value of the estimated b_{4k} across all fifty procedures is .280, implying that a ten percent change in real premiums per capita would be associated with a 2.80 percent change in mean fees in states. On averge, PREMCOV had the greatest effects on fees for physicians' visits, and the least on charges for ancillary services. However, scrutiny of the estimates of b_{4k} in Appendix IV-3 reveals the relatively narrow bounds within which most of them fell. In thirty-two of the fifty price level equations, they were within the range .20 to .50 and, of those, sixteen were significant at the .10 level or better. The validity of these results is supported by other econometric studies of physicians' fees. They reported insurance elasticities of prices similar in magnitude to those estimated here.*

The foregoing implies that selecting a numeraire whose coefficient on PREMCOV is near the mean will generate a relative price series that is largely unaffected by that measure of insurance. Or, at least, the new series will not be affected by health insurance as much as the set of price levels.

The best performing explanatory variable in the fifty price level equations was PCTCINS, the share of the state health insurance market controlled by commercial carriers. Estimated elasticities of fees with respect to that variable were positive and significant, at the 0.10 level or better, in thirty-seven of fifty equations. In only three cases were coefficients of PCTCINS negative. As discussed, the sign of that variable could not be determined a priori, since both commercial and Blue Shield

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*Feldstein (1970) examined the relationship between an index of physicians' prices and an aggregate health insurance variable using national data spanning the period 1948 to 1966. Among his reported findings was a long-run insurance elasticity of price in the neighborhood of 0.36, and a short-run elasticity of 0.20. Steinwald and Sloan (1974) reported significant elasticities of individual physicians' usual charges with respect to the extent of major medical insurance coverage in states. These elasticities were in the range 0.19 to 0.30. In a later study Sloan (1976) reported less significant and smaller elasticities of state-average fees with respect to major medical coverage; however, the elasticity for office visits was 0.17 and statistically significant. More significant insurance effects were reported by Sloan in that study vis a vis average practice revenues; elasticities with respect to major medical coverage were between 0.48 and 0.52 in value.

insurance had elements that could be considered potentially inflationary. These results at least suggest that some structural dimension of commercial insurance (arguably, the promulgation of commercially-sponsored major medical coverage) exerted significant upward pressure on statewide average fees during the mid 1970s.

Table IV-1 contains means of estimated coefficients of PCTCINS across the fifty regressions. As was true for the other insurance variable, these values fell within a relatively narrow band; thirty-nine within the range 0.20 to 0.50. Of those, thirty-three were significantly different from zero at the 0.10 level or better. Again, if a numeraire procedure's coefficient of PCTCINS is near the mean for all procedures, the resulting series of relative prices will exhibit less sensitivity to health insurance than did the price levels.

Among the other explanatory variables in the price level regressions, coefficients of average post-high schol educational attainment (EDUC) and of the percent of the population over age 65 in states (PCT65) were rarely statistically significant. In the case of PCT65, lack of significance could possibly be attributed to the lack of variation in that measure across states.*

Physicians per capita (DOCSPOP) was positively and significantly associated with state-average prevailing fees in many of the regressions. This was especially true for the thirty surgical procedures and medical visits, where the coefficient of DOCSPOP was positive and significant in fifteen equations. While a positive association between fees and physicians per capita is contrary

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*Mean values for EDUC and PCT65 were 0.46 and 10.97 across all states; standard deviations were .175 and 1.76, respectively.

to the hypothesis that DOCSPOP is a supply variable, it is not inconsistent with past research findings.*

F. RELATIVE FEES AND INSURANCE

Given log-linear price equations for the k^{th} procedure and numeraire (n), the relative price equation is:

$$(9) \quad \ln(P_k/P_n) = b_{okn} + b_{1kn}\ln(EDUC) + b_{2kn}\ln(PCT65) + b_{3kn}\ln(DOCSPOP) + b_{4kn}\ln(PREMCOV) + b_{5kn}\ln(PCTCINS)$$

Of primary interest are the coefficients of the two health insurance variables. Reasonable approximations of b_{4kn} and b_{5kn} are the arithmetic differences $(b_{4k}-b_{4n})$ and $(b_{5k}-b_{5n})$, which one could compute directly from parameters of the price level regressions.** However, by directly estimating relative value regression equations, the study obtained estimates of b_{4kn}

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*In the analysis, most state-specific explanatory variables (X) are invariant with respect to the price level of the k procedures under study. Therefore, price level equations $P_k = X^{b_k}$ and $P_n = X^{b_n}$ imply relative price equations: $P_k/P_n = X^{b_k}/X^{b_n} = X^{(b_k - b_n)} = X^{b_{kn}}$. If one had been able to estimate all equations over data for all states, the computed difference $(b_{4k}-b_{4n})$ and $(b_{5k}-b_{5n})$ would have been identical to least squares estimates of parameters in the relative value equations. However, fee data on all procedures were not available for all states; also, a different physicians' per capita variable was used in each regression corresponding to the physician specialty most likely to perform the procedure. Therefore, estimates of parameters of equations (9) differ somewhat from computed differences between parameters of equations (8) for price levels.

**See, for example: Newhouse (1970) and Feldstein (1970); Sloan (1974) reported mixed results in terms of signs on physicians per capita variables in specialists fee equations in contrast to those for general practicioners--the latter were more in keeping with traditional economic theory than the former, Dyckman (1978) reported that measures of surgeons per capita were positively and significantly associated with fees in metropolitan areas.

and b_{5kn} and their standard errors; the latter being necessary for computing statistical significances. In all relative value regressions, the numeraire procedure was a comprehensive, new patient, office visit.

Appendix IV-3 contains least squares estimates of parameters for relative fee equations; Table IV-2 summarizes coefficients of the health insurance variables. As expected, they are closer to zero in value than were their counterparts in price level regressions. Over all fifty relative price equations, the mean estimate of the coefficient of PREMCOV was .032, while the mean estimate of the coefficient of PCTCINS was -.060. Contrast these with the greater overall mean values for the price level equations reported in Table IV-1.

Table IV-2

Insurance Elasticities
Mean Values for Classes of Procedures
(Relative Fee Equations)

Name	Class Size	Mean Coefficients (Elasticities) of Insurance Variables	
		PREMCOV	PCTCINS
Surgery	22	-.003	-.050
Visits	08	-.027	-.111
Radiology	07	.322	-.034
Ancillaries	13	-.027	-.063
All Procedures	50	.032	-.060

In the relative price regressions, the coefficients of PREMCOV were never statistically significant, while those of PCTCINS were significant at the 10 percent level or better in only four equations. Elasticities of relative fees were respect to PCTCINS ranged between -0.100 and +0.100 in thirty-three of fifty cases. The same range covered coefficients of PREMCOV in twenty-three equations.

In sum, the estimated insurance effects on relative fees were generally within a narrow range of values around zero. Furthermore, the coefficients of PREMCOV and PCTCINS were small in relationship to their standard errors, rendering them essentially indistinguishable from zero, statistically.

G. SUMMARY AND CONCLUSIONS

This study's goal was to determine the effects of health insurance on prices of physicians' services and, consequently, the usefulness of relative charges as the foundation of a fee schedule. It showed how total insurance effects on physicians' charges were dependent on coverage levels and on the responsiveness of fees to shifts in that coverage. Also, the study defined the conditions under which relative prices would be less sensitive than price levels to insurance distortion.

In the empirical analyses of prices of fifty Medicare procedures, insurance elasticities of fee levels were positive and significant in many instances, and consistently fell within a narrow range of values. By implication, a numeraire procedure whose price-responsiveness to health insurance was close to the mean across all procedures would generate a series of relative fees less sensitive than price levels to insurance distortion. Subsequent regression analyses of relative fee equations confirmed that assertion.

Before drawing conclusions, it is important to acknowledge some possible shortcomings of the analyses. Chief among them is the possibility that the estimated effects of insurance on prices are biased owing to econometric problems associated with: issues of equation specification, the use of ordinary least squares regression techniques, and the use of a single set of state-specific insurance measures in all price equations.

Specification bias can occur if one or more important and influential variables are omitted from the regression equations. In particular, per capita income was omitted from the price equations due to the high degree of correlation between it and the insurance premiums-per-capita variable. Inclusion of both variables in the equations could yield imprecise estimates of the effects of one or both on physicians' fees. However, the expedient of strengthening the precision of the estimated regression coefficients on insurance by dropping the income variable comes at the risk of possible specification biases of the coefficients of all the included variables. The extent of such biases is a function of the correlation between the included and excluded variables and the strength of the independent effect of the excluded variables on physicians' fees.*

The second possible source of bias is the use of actual rather than instrumental insurance variables in the price equations. The latter would be appropriate if current period purchases of health insurance are a function of current period physicians' fees. The study assumed a different relationship: namely that fees affect purchases of insurance with a lag. Current year's purchases of health insurance are dependent on <u>past</u> years' fee levels. That assumed recursive relationship between insurance purchases and physicians' charges permits the use of ordinary least squares estimation of the price equations. However, if that assumption is invalid for one or more procedures, the ordinary least squares parameter estimates could suffer from simultaneous equation bias.**

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*See Johnston (1972, pp. 168-169).

**See Johnston (1972, pp. 341-348).

If so, more sophisticated two-stage least squares or other estimation methods must be employed to obtain unbiased estimates of the effects of health insurance on physicians' prices.

A third source of possible estimation bias is the assumption that the state-wide insurance variables are equally valid proxies of the insurance coverage of all procedures in the study. That assumption may not be valid in all cases: for example, interstate variation in gross health insurance purchases per capita may be a better proxy of the variation in insurance for commonly covered hospital procedures rather than for less-well-covered office visits. If so, the use of statewide per capita insurance coverage variables in office procedures' price equations could result in an errors-in-variables bias of the associated regression coefficients. In effect, the estimated relationship between health insurance and office procedures would be biased because of an implicit error in the measurement of the appropriate health insurance variable. The extent of the bias is a function of the variance in that measurement error across states for each procedure in the study.*

The upshot of these econometric issues is that the empirical results of the study must be considered suggestive rather than definitive. Additional research is needed using alternative specifications of equations, alternative measures of health insurance, and more sophisticated analytic techniques to corroborate these preliminary findings on the relationships between relative fees and insurance coverage.

Due to data availability, the scope of this analysis was restricted to an investigation of insurance effects on relative prices for commonly performed services. The effects of insurance on prices of new or less common procedures was not investigated, and the results of the present study may not apply to

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*See Johnston (1972, pp. 281-283), and Maddala (1977, pp. 292-294).

such procedures. One reason for caution is that there is some reason to believe that pervasive UCR payment methods may have contributed more strongly to inflation in the prices of new or complex services than to the increases in fees for routine procedures.*

Regarding procedures in the former category, patients and insurers may have little information for gauging the appropriateness of particular providers' charges. Also, the physicians' time and other resource inputs to the production of such procedures may exceed the efficient levels established once the services become more routine. However, under UCR payment rules, the charges associated with the resource-intensive protocols of the developmental stage are the floor or baseline for reasonable payment screens in subsequent years. For that reason, the inflationary effect of health insurance on new or complex procedures may be greater than the effect on prices of more routine services. Hence, caution is required when interpreting relative charges of the former as relative values. HCFA or other third party payers may wish to develop special rules for setting relative values for procedures considered new or complex.

These caveats aside, the theoretical and empirical results of this study support the contention that <u>relative</u> prices are appropriate as the foundation of relative value schedules: at least in the case of the common procedures investigated herein. The study's findings suggest that charge-based RV schedules may not suffer from the same degree of insurance-induced distortions as do the underlying charge <u>levels</u>. That, coupled with the ease of constructing RV scales from charge data are important reasons for considering that approach.

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*See: Roe, Benson. "The UCR Boondoggle", <u>The New England Journal of Medicine</u>, v.305, n.1; July 2, 1981 (pp. 41-45).

APPENDIX IV-1

The Effects of Alternative Measures of Health Insurance on Prices of Physicians' Services

In principal, prices of physicians' services are a function of both the level of insurance coverage in a region and the responsiveness (elasticity) of prices to shifts in that coverage. Unfortunately, readily available, state level data on health insurance are gross measures (primarily aggregate expenditures and estimates of total covered population) and undifferentiated across medical procedures. This appendix investigates how the effects of gross health insurance on physicians' fees are related to the effects of procedure-specific coverage on fees.

For analytic convenience, assume the relationship between procedure-specific insurance (I_k) and a gross measure of health insurance (I) can be approximated by the expression: $I_k = I^{a_k}$. The price of the k^{th} procedure is now:

$$\text{i)} \quad P_k = I_k^{b_k} \cdot X^{c_k} = (I^{a_k})^{b_k} \cdot X^{c_k} = I^{e_k} \cdot X^{c_k}$$

The elasticity (e_k) of price with respect to procedure-undifferentiated insurance is revealed to be a composite of two parameters; the elasticity (b_k) of price with respect to procedure-specific coverage, and the elasticity (a_k) of procedure-specific insurance with respect to the gross measure of coverage.

Postulating true coverage of the numeraire to be a multiplicative function of the gross, procedure-undifferentiated insurance variable, the relative price (P_k') of the k^{th} procedure becomes:

ii) $$P'_k = ((I^{a_k})^{b_k} \cdot X^{c_k})/((I^{a_n})^{b_n} \cdot X^{c_n})$$
$$= (I^{e_k} \cdot X^{c_k})/(I^{e_n} \cdot X^{c_n}) = I^{e_k - e_n} \cdot X^{c_k - c_n}$$

This specification appears as equation (7) in the text.

An important consequence of the foregoing is that empirical estimates of the insurance effect on relative fees based upon the gross health insurance measure will be approximately equal to the analogous effect of "true" coverage if the elasticity (a_k) is approximately 1.0 across all procedures. In other words, if increases in gross health insurance in a state acts as a rising tide uniformly lifting procedure-specific coverage, then the use of (I) rather than (I_k) in empirical analyses is innocuous. For in that case:

iii) $$(I^{e_k}/I^{e_n}) = (I^{a_k b_k}/I^{a_n b_n}) = (I_k^{b_k}/I_n^{b_n})$$
$$= (I^{1b_k}/I^{1b_n}) = (I_k^{b_k}/I_n^{b_n})$$

As shown, when a_k takes the value 1.0 uniformly, the effects of health insurance on prices are the same for coverage measured as (I_k) or as (I).

Finally, it straightforward to demonstrate that the composite nature of e_k is not an artifact of the multiplicative form of the price and insurance equations. It is, instead, a general result. To establish this, define the elasticity of the k^{th} procedure's price (P_k) with respect to "true" insurance coverage (I_k) as:

iv) $$b_k = (\partial P_k/P_k)/(\partial I_k/I_k) = (\partial P_k/\partial I_k)\ (I_k/P_k)$$

Now, assume the true, procedure specific, insurance coverage is a general function of gross health insurance in a state:

v) $$I_k = h(I)$$

Having established these relationships, the elasticity of the k^{th} procedure's price with respect to gross insurance is:

vi) $e_k = (\partial P_k / \partial I) \cdot (I/P_k)$

which, upon application of the chain rule becomes:

vii)
$$\begin{aligned} e_k &= \partial P_k / \partial I_k \cdot \partial I_k / \partial I \cdot I/P_k \cdot I_k/I_k \\ &= (\partial P_k / \partial I_k \cdot I_k/P_k) \cdot (\partial I_k / \partial I \cdot I/I_k) \\ &= b_k \cdot a_k \end{aligned}$$

In other words, the elasticity (e_k) of price with respect to gross state-wide health insurance is, in general, a composite of two other elasticities (b_k) and (a_k) which was to be shown.

APPENDIX IV-2

Construction of Health Insurance Variables

In this report are two measures of health insurance. The first, PREMCOV, is the ratio of (deflated) private health insurance premiums to the state population with private health insurance coverage in 1976. The second, PCTCINS, is the percentage of total private health insurance premiums paid to commercial carriers in the state. These variables, in turn, are constructed from data on insurance coverage and populations from several sources according to the following formulae:

PREMCOV = INSUR/((SIEPC65 * NONOLD) + (.539 * OLDPOP))

PCTCINS = (.796 * COMINS)/INSUR

Definitions of the primary variables follow:

BCINS	Health insurance premiums paid in 1976 to Blue Cross-Blue Shield and other medical society plans in the state (Source: Health Insurance Institute, <u>Source Book of Health Insurance Data 1977-1978</u>).
COMINS	Health insurance premiums paid in 1976 to commercial insurers in the state (Source: 1977-1978 Source Book).
.796	Income loss insurance adjustment factor; equivalent to the ratio of premiums paid to commerical insurers, nationwide, for hospital and medical coverage to premiums paid to commerical carriers for hospital, medical, and income loss protection. (Source: 1976 data premiums in <u>Source Book of Health Insurance Data 1978-1979</u>.)
INSUR	Total health insurance premiums paid in the state during 1976 to private insurers, net of income loss protection. INSUR = BCINS + (.796 COMINS)
SIEPC65	Estimated proportion of the state population under age 65 with health insurance coverage; estimate is net of duplicate coverage. (Source: 1976 Survey of Income and Education; U.S. Department of Commerce, Bureau of Census--as reported in Luft and Maerki 1982.)
OLDPOP	State population age 65 and over in 1978.

NONOLD State population less than 65 years of age in 1978. (Source: State and Metropolitan Area Data Book 1979; U.S. Department of Commerce, Bureau of the Census.)

.593 Estimated fraction of the U.S. population age 65 and older with private health insurance coverage (Source: insured population, 1977-1978 Source Book; total population, Statistical Abstract of the United States 1982-83).

Appendix IV-3

Table IV-3.1

Summary of Regression Results[a]

	Price Level Equations						
	R-Squared	Regression Coefficients (Standard Errors)					
PROCEDURE	PROB > F	CONSTANT	DOCSPOP	EDUC	PCT65	PREMCOV	PCTCINS
Surgical							
Skin Biopsy	.339 .0035	-2.467** (1.416)	.573* (.280)	-.126* (.051)	.000 (.169)	.480* .204)	.424* (.129)
Radical Mastectomy	.463 .0001	1.552** (.932)	.427* (.186)	-.058** (.034)	-.076 (.109)	.482* (.132)	.364* (.084)
Reduction of Fracture	.244 .0331	2.372 (1.526)	.556 (.337)	-.102 (.095)	.209 (.183)	.230 (.206)	.397* (.115)
Arthrotomy	.338 .0036	2.336** (1.406)	.421 (.311)	-.025 (.088)	-.233 (.170)	.231 (.193)	-.177** (.107)
Puncture Bursa	.228 .0632	-.558 (1.899)	.467 (.381)	.080 (.074)	-.237 (.222)	.381 (.268)	.231 (.171)
Bronchoscopy	.198 .0886	1.492 (1.291)	.373 (.256)	-.000 (.047)	-.062 (.154)	.283 (.186)	.312* (.117)
Thoracentesis	.375 .0011	-3.152 (1.963)	1.166* (.390)	-.175* (.072)	-.278 (.234)	.499** (.283)	.452* (.179)
Heart Catheter	.114 .4268	1.633 (2.510)	.055 (.145)	-.011 (.087)	.065 (.287)	.459 (.357)	.334** (.167)
Insert Pacemaker	.461 .0003	2.026 (1.513)	.123 (.098)	.022 (.051)	.013 (.170)	.438** (.221)	.554* (.104)
Blood Transfusion	.126 .3503	.077 (2.631)	1.144* (.515)	.011 (.097)	-.116 (.307)	-.188 (.378)	.324 (.238)
Colectomy	.266 .0221	3.341* (1.026)	.339* (.204)	.016 (.038)	-.006 (.124)	.221 (.151)	.327* (.095)
Appendectomy	.287 .0177	2.537* (1.201)	.162 (.243)	-.004 (.041)	-.061 (.136)	.322** (.163)	.344* (.110)
Sigmoidoscopy	.269 .0183	.132 (1.235)	.632* (.245)	-.083** (.045)	-.112 (.147)	.196 (.178)	.218** (.112)

Table IV-3.1 (Continued)

Summary of Regression Results[a]

PROCEDURE	R-Squared PROB > F	Price Level Equations: Regression Coefficients (Standard Errors) CONSTANT	DOCSPOP	EDUC	PCT65	PREMCOV	PCTCINS
Hemorrhoidectomy	.270 .0230	1.192 (1.273)	.246 (.240)	-.071 (.045)	-.008 (.144)	.463* (.181)	.344* (.113)
Cholecystectomy	.380 .0009	2.794* (.879)	.170 (.175)	.022 (.032)	-.047 (.105)	.366* (.127)	.320* (.080)
Repair Hernia	.535 .0001	1.802* (.733)	.355* (.146)	.007 (.027)	-.067 (.087)	.311* (.106)	.417* (.067)
Cystoscopy	.367 .0016	4.858* (1.313)	.950** (.479)	.025 (.062)	-.309 (.200)	-.070 (.202)	-.172** (.096)
Dilate Urethra	.234 .0453	2.276 (1.859)	.663 (.678)	.129 (.088)	-.230 (.283)	.068 (.286)	.065 (.136)
Prostatectomy	.319 .0051	4.296* (.867)	.410 (.316)	-.001 (.041)	-.131 (.132)	.238** (.134)	.231* (.063)
Prostate	.430 .0002	3.993* (.871)	.606** (.318)	.005 (.041)	-.188 (.133)	.237** (.134)	.289* (.063)
Hysterectomy	.409 .0004	4.379* (.820)	.256* .082)	.011 (.030)	.051 (.100)	.110 (.136)	.225* (.060)
Extraction of Lens	.478 .0001	3.560* (.868)	.403** (.230)	-.031 (.055)	-.060 (.099)	.273** (.148)	.245* (.068)
<u>Medical</u>							
Initial Office Visit Lim., New Patient	.301 .0127	-2.885 (2.111)	.384* (.184)	-.052 (.084)	.213 (.265)	.522 (.336)	.379* (.183)
Initial Office Visit[b] Comp., New Patient	.412 .0003	1.748 (1.305)	.114 (.113)	.059 (.051)	-.513* (.163)	.315 (.204)	.343* (.113)
Minimal Office Visit Estab. Patient	.111 .5260	2.917 (2.462)	.107 (.223)	.047 (.099)	-.305 (.305)	.005 (.409)	-.141 (.218)
Routine Office Visit Brief Follow-Up, Estab. Patient	.454 .0002	-1.041 (1.037)	.250* (.088)	-.060 (.041)	-.170 (.134)	.387* (.164)	.277* (.088)

Table IV-3.1 (Continued)

Summary of Regression Results[a]

PROCEDURE	R-Squared PROB > F	Price Level Equations Regression Coefficients (Standard Errors)					
		CONSTANT	DOCSPOP	EDUC	PCT65	PREMCOV	PCTCINS
Routine Home Visit Brief Follow-Up	.364 .0015	-.184 (.912)	.154** (.079)	-.007 (.036)	-.106 (.114)	.334* (.142)	.281* (.079)
Initial Hospital Visit Brief	.095 .5711	.196 (1.935)	.031 (.173)	-.030 (.080)	.095 (.243)	.457 (.309)	.147 (.163)
Initial Hospital Visit Comprehensive	.318 .0062	2.140 (1.354)	-.053 (.119)	.122* (.054)	-.281 (.173)	.344 (.212)	.221** (.118)
Routine Hospital Visit Brief Follow-Up	.399 .0006	-.732 (1.190)	.259* (.103)	-.016 (.048)	-.271** (.152)	.347** (.186)	.340* (.102)
Chest X-Ray	.212 .0791	-2.815 (1.879)	1.546 (1.220)	-.287 (.223)	-.055 (.293)	.090 (.559)	.597* (.258)
Spine X-Ray	.209 .0769	-1.379 (2.009)	1.727 (1.197)	-.204 (.223)	-.030 (.305)	-.194 (.543)	.683* (.269)
Hip X-Ray	.237 .0530	.821 (1.731)	1.066 (1.069)	-.024 (.195)	.014 (.256)	-.199 (.498)	.391** (.227)
Stomach X-Ray	.307 .0112	-3.192 (2.168)	-.371 (1.390)	.161 (2.56)	.037 (.338)	1.143** (.627)	.417 (.298)
Colon X-Ray	.217 .0651	-1.388 (1.939)	.055 (1.155)	.036 (.215)	-.063 (.295)	.715 (.524)	.373 (.259)
Cobalt	.081 .6461	.883 (2.413)	1.337 (1.583)	-.277 (.292)	-.055 (.388)	-.098 (.710)	.495 (.341)
Radiotherapy	.145 .3053	.214 (2.925)	-1.172 (1.712)	.105 (.321)	.120 (.458)	.734 (.743)	.232 (.411)
<u>Lab and Other Tests</u>							
Hemoglobin	.255 (.0288)	-2.124** (1.180)	.085 (.100)	-.012 (.046)	.151 (.145)	.251 (.184)	.361* (.101)

Table IV-3.1 (Continued)

Summary of Regression Results[a]

PROCEDURE	R-Squared PROB > F	CONSTANT	DOCSPOP	EDUC	PCT65	PREMCOV	PCTCINS
		Price Level Equations: Regression Coefficients (Standard Errors)					
White Cell Count	.145 .2485	-.487 (1.462)	.032 (.124)	.041 (.057)	.201 (.179)	.036 (.227)	.261* (.126)
Blood Count	.356 .0022	-.012 (.941)	-.191* (.080)	.028 (.037)	.124 (.115)	.323* (.146)	.185* (.081)
Cholesterol	.296 .0124	1.629 (1.134)	-.164 (.101)	.034 (.045)	-.063 (.140)	.078 (.177)	.146 (.098)
Hematocrit	.165 .1763	-1.391 (1.216)	-.060 (.103)	-.000 (.047)	.163 (.149)	.292 (.189)	.221* (.104)
Prothrombin	.194 .1110	-.181 (1.258)	-.037 (.108)	-.002 (.050)	-.019 (.157)	.214 (.197)	.256* (.107)
Sedimentation Rate	.128 .3237	-.873 (1.223)	.011 (.104)	-.049 (.047)	.013 (.150)	.284 (.190)	.201** (.105)
Blood Sugar	.361 .0023	.545 (1.278)	-.195** (.113)	.033 (.050)	-.098 (.158)	.221 (.199)	.246* (.111)
Bun Urea Nitrogen	.520 .0001	.435 (1.128)	.240* (.100)	.055 (.045)	.073 (.140)	.168 (.175)	.294* (.097)
Pap Test	.234 .0459	-1.060 (1.475)	.0168 (.125)	-.0087 (.057)	.195 (.181)	.230 (.230)	.385* (.127)
Urinalysis	.214 .0699	-1.333 (1.257)	-.036 (.107)	.010 (.049)	.073 (.154)	.304 (.196)	.296* (.108)
EKG	.195 .0939	1.827** (.909)	.013 (.079)	.066** (.036)	-.060 (.113)	.193 (.142)	.101 (.079)
EEG	.242 .0384	.551 (1.653)	-.162 (.193)	.044 (.086)	-.147 (.197)	.471** (.240)	.345* (.141)

Notes: [a]All variables entered in log form.

[b]Numeraire procedure.

*Coefficients are significantly different from zero at the .05 level.
**Coefficients are significantly different from zero at the .10 level.

Table IV-3.2

Summary of Regression Results[a]

PROCEDURE	R-Squared PROB > F	CONSTANT	DOCSPOP	EDUC	PCT65	PREMCOV	PCTCINS
		Relative Price Equations — Regression Coefficients (Standard Errors)					
Surgical							
Skin Biopsy	.310 .0075	-3.728* (1.817)	.289 (.360)	-.194* (.066)	.524* (.217)	.165 (.262)	.050 (.165)
Radical Mastectomy	.283 .0150	.544 (1.410)	.097 (.281)	-.118* (.051)	.433* (.165)	.152 (.200)	-.016 (.127)
Reduction of Fracture	.234 .0412	1.249 (1.751)	.101 (.387)	-.071 (.110)	.659* (.210)	-.113 (.236)	.085 (.132)
Arthrotomy	.341 .0034	1.251 (1.679)	-.045 (.372)	.009 (.105)	.225 (.203)	-.124 (.230)	-.484* (.127)
Puncture Bursa	.163 .2050	-1.760 (1.932)	.186 (.388)	.038 (.075)	.285 (.226)	.063 (.273)	-.151 (.174)
Bronchoscopy	.169 .1539	.312 (1.683)	.082 (.334)	-.066 (.062)	.447* (.200)	-.043 (.242)	-.056 (.153)
Thoracentesis	.297 .0091	-4.332** (2.301)	.876** (.457)	-.241* (.084)	.231 (.274)	.172 (.331)	.085 (.209)
Heart Catheter	.122 .3852	-1.319 (2.738)	-.090 (.158)	-.068 (.095)	.620* (.313)	.258 (.390)	.060 (.182)
Insert Pacemaker	.196 .1467	-1.253 (2.214)	-.047 (.143)	-.040 (.075)	.569* (.249)	.291 (.324)	.295** (.152)
Blood Transfusion	.139 .2864	-1.583 (2.989)	.860 (.585)	-.054 (.110)	.385 (.349)	-.444 (.430)	-.015 (.270)
Colectomy	.253 .0302	2.168 (1.366)	.050 (.271)	-.049 (.050)	.506* (.165)	-.111 (.201)	-.038 (1.26)
Appendectomy	.196 .1163	.945 (1.754)	-.148 (.354)	-.076 (.060)	.495* (.199)	.044 (.237)	-.005 (.161)
Sigmoidoscopy	.315 .0057	-1.048 (1.675)	.341 (.332)	-.149* (.061)	.397** (.199)	-.131 (.241)	-.150 (.152)
Hemorrhoidectomy	.282 .0174	-.844 (1.713)	-.027 (.323)	-.155* (.060)	.498* (.194)	.242 (.244)	.035 (.152)

Table IV-3.2 (Continued)

Summary of Regression Results[a]

PROCEDURE	R-Squared PROB > F	Relative Price Equations: Regression Coefficients (Standard Errors) CONSTANT	DOCSPOP	EDUC	PCT65	PREMCOV	PCTCIN
Cholecystectomy	.195 .0926	1.614 (1.384)	-.121 (.275)	-.044 (.051)	.461* (.165)	.040 (.199)	-.048 (.126)
Repair Hernia	.205 .0762	.622 (1.357)	.065 (.269)	-.059 (.050)	.442* (.162)	-.015 (.195)	.049 (.124)
Cystoscopy	.302 .0092	2.425 (1.982)	.292 (.723)	.002 (.094)	.346 (.302)	-.303 (.305)	-.453* (.145)
Dilate Urethra	.128 .3255	-.156 (2.407)	.005 (.878)	.106 (.114)	.425 (.367)	-.165 (.370)	-.216 (.176)
Prostatectomy	.220 .0554	2.049 (1.387)	-.316 (.506)	-.014 (.066)	.546* (.212)	-.010 (.214)	-.071 (.101)
Prostate	.177 .1337	1.746 (1.407)	-.119 (.513)	-.008 (.067)	.488* (.215)	-.010 (.217)	-.013 (.102)
Hysterectomy	.235 .0403	2.221 (1.348)	.061 (.135)	-.065 (.049)	.465* (.165)	-.109 (.224)	-.068 (.099)
Extraction of Lens	.162 .1762	1.140 (1.516)	-.130 (.402)	.001 (.095)	.463* (.173)	.089 (.259)	.028 (.119)
<u>Medical</u>							
Initial Office Visit Lim., New Patient	.286 .0181	-4.269** (2.396)	.309 (.209)	-.115 (.096)	.732* (.301)	.113 (.381)	.038 (.208)
Initial Office Visit[b] Comp., New Patient							
Minimal Office Visit Estab. Patient	.195 .1742	1.785 (2.559)	.063 (.232)	-.029 (.103)	.242 (.317)	-.481 (.425)	-.482* (.226)
Routine Office Visit Brief Follow-Up, Estab. Patient	.261 .0357	-3.023** (1.639)	.118 (.139)	-.106 (.065)	.406** (.219)	.099 (.259)	-.068 (.140)

Table 3.2 (Continued)

Summary of Regression Results[a]

PROCEDURE	R-Squared PROB > F	Relative Price Equations: Regression Coefficients (Standard Errors) CONSTANT	DOCSPOP	EDUC	PCT65	PREMCOV	PCTCINS
Routine Home Visit Brief Follow-Up	.203 .0794	-1.932 (1.369)	.040 (.118)	-.065 (.054)	.407* (.171)	.019 (.214)	-.062 (.118)
Initial Hospital Visit Brief	.170 .2081	-.749 (2.211)	.013 (.197)	-.081 (.091)	.497** (.278)	-.018 (.353)	-.179 (.186)
Initial Hospital Visit Comprehensive	.121 .3593	.385 (1.220)	-.179* (.108)	.068 (.049)	.253 (.156)	.033 (.191)	-.129 (.106)
Routine Hospital Visit Brief Follow-Up	.134 .2943	-2.603 (1.663)	.135 (.144)	-.067 (.067)	.270 (.212)	.051 (.260)	-.005 (.142)
Chest X-Ray	.198 .1041	-5.046* (2.212)	.058 (1.437)	-.116 (.262)	.636** (.345)	.372 (.658)	.087 (.340)
Spine X-Ray	.146 .2429	-3.224 (2.337)	1.000 (1.391)	-.158 (.259)	.549 (.355)	-.277 (.631)	.277 (.312)
Hip X-Ray	.175 .1698	-2.155 (2.059)	-.485 (1.272)	.142 (.232)	.714 (.305)	.213 (.593)	-.087 (.270)
Stomach X-Ray	.171 .1812	-4.055 (2.231)	-1.334 (1.431)	.248 (.263)	.689 (.348)	1.050 (.646)	-.155 (.306)
Colon X-Ray	.118 .3753	-3.233** (1.942)	-.672 (1.157)	.082 (.215)	.516** (.295)	.632 (.525)	-.033 (.260)
Cobalt	.178 .1717	-1.597 (2.600)	.246 (1.706)	-.169 (.315)	.611 (.418)	-.177 (.765)	-.081 (.368)
Radiotherapy	.194 .1411	-.961 (3.027)	-1.585 (1.772)	.097 (.333)	.768 (.474)	.440 (.769)	-.251 (.425)
<u>Lab and Other Tests</u>							
Hemoglobin	.280 .0161	-4.300* (1.543)	-.021 (.131)	-.064 (.060)	.657* (.189)	-.006 (.240)	.049 (.133)

Table IV-2 (Continued)

Summary of Regression Results[a]

PROCEDURE	R-Squared PROB > F	Relative Price Equations: Regression Coefficients (Standard Errors) CONSTANT	DOCSPOP	EDUC	PCT65	PREMCOV	PCTCINS
White Cell Count	.249 .0326	-2.662 (1.818)	-.073 (.155)	-.011 (.071)	.707* (.223)	-.220 (.283)	-.051 (.156)
Blood Count	.327 .0049	-2.188 (1.514)	-.296* (.129)	-.024 (.059)	.630* (.186)	-.066 (.235)	-.127 (.130)
Cholesterol	.327 .0058	-.511 (1.464)	-.280* (.130)	-.014 (.058)	.434* (.181)	-.172 (.228)	-.172 (.127)
Hematocrit	.268 .0210	-3.567* (1.668)	-.165 (.142)	-.052 (.065)	.669* (.204)	.035 (.260)	-.091 (.143)
Prothrombin	.227 .0583	-2.476** (1.459)	-.130 (.125)	-.061 (.058)	.462* (.182)	-.019 (.228)	-.054 (.124)
Sedimentation Rate	.247 .0345	-3.049** (1.608)	-.095 (.137)	-.101 (.062)	.519* (.197)	.028 (.250)	-.111 (.138)
Blood Sugar	.369 .0019	-1.595 (1.340)	-.312* (.119)	-.016 (.053)	.400* (.166)	-.029 (.209)	-.071 (.116)
Bun Urea Nitrogen	.418 .0007	-2.118 (1.425)	-.329* (.126)	-.010 (.057)	.539* (.177)	-.031 (.222)	.006 (.122)
Pap Test	.281 .0158	-3.236** (1.729)	-.089 (.147)	-.060 (.067)	.701* (.212)	-.026 (.269)	.073 (.149)
Urinalysis	.247 .0343	-3.509* (1.524)	-1.42 (.130)	-.042 (.059)	.579* (.187)	.048 (.237)	-.016 (.131)
EKG	.281 .0137	.080 (1.235)	-.101 (.107)	.008 (.049)	.454* (.154)	-.122 (.193)	-.242* (.107)
EEG	.187 .1183	-1.066 (1.682)	-.309 (.196)	.019 (.088)	.356** (.201)	.092 (.244)	-.008 (.143)

Notes: [a]All variables entered in log form.

[b]Numeraire procedure.

*Coefficients are significantly different from zero at the .05 level.

**Coefficients are significantly different from zero at the .10 level.

CHAPTER V

SEEKING THE "JUST" PRICE: RELATIVE VALUE SCALES AND FEE SCHEDULES FOR PHYSICIANS' SERVICES*

Jack Hadley
Robert Berenson**

A. INTRODUCTION

Early Christian theologians believed that reason alone could, and perhaps more importantly, should be the basis for establishing the fair price for goods.*** Either disdain for bargaining or an ethical aversion to latter day economics' paradigm of greedy behavior led them to distrust the market. (This was several centuries before Adam Smith sanitized greed by calling it the invisible hand.) Like many other scholastic issues, however, pursuit of the just price through reason was not fruitful.

In some ways, the current health policy debate over how to pay physicians resembles the vain search for the just price. Many insurers, government officials and even physicians are unhappy with the prices and fees generated by the market for physicians' services. They believe that physicians can manipulate and distort fees: fees are too high for some services and too low for other services. (The latter seems odd, given physicians' alleged ability to control prices.) Insurance doesn't cover all physicians' services to the same degree, and that too creates distortions in fees.

Of more immediate concern to policymakers, however, is the size and rate of growth of spending for physicians' services. Among insurers generally, and in the Medicare program especially, limiting spending for physicians' services

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***Reinhardt (1984), noting that Aristotle originated the doctrine of the just price and St. Thomas Aquinas developed it more fully, describes the doctrine as the basis of the "standard of comparable worth," which is one method for determining physicians' incomes.

is a top priority. As a result, Congress recently passed legislation that takes a big step toward establishing a Medicare fee schedule in order to limit Medicare's spending for physicians' services. But this is only a first step, since Congress and many insurers and providers all feel that existing fees for specific services are "out of line" in relation to each other and need to be adjusted.

This paper discusses the development and use of a fee schedule for physicians' services as an alternative to current systems of paying physicians. It's main focus is on the process for developing a fee schedule. We propose three steps. The first is the development of a relative cost scale, which shows the relationship among physicians' services on the basis of their average production costs.

Many believe that production costs should be the primary, if not the sole determinant of fees. We argue that this view is too narrow. Production costs are a reasonable and logical starting point. But other important factors should also influence how much an insurer is willing to pay for a service--its benefit to the patient, its implications for spending on other health care and nonhealth services, insurers' beliefs and objectives for how health care should be provided, and insurers' resources and budgets, just to name a few. In the second step, the relative cost scale is modified to produce the relative value scale, which incorporates a concept of value broader and more subjective than costs alone.

The third step is choosing the monetary conversion factors or multipliers. These translate the relative value scale numbers into the fee schedule, which lists the amount of money the insurer is willing to pay for each service.

Although somewhat arbitrary, dividing the process into these three steps may facilitate development, implementation, and maintenance of a fee schedule. All insurers, public and private, confront essentially the same production costs of providing physicians' services. Even though numerous assumptions and judgments must be made to define and measure production costs, this is nevertheless a relatively technical activity. Reaching a consensus on what production costs are should be easier than reaching agreement on more subjective values and objectives. Therefore, this step can be broad-based, involving many insurers, providers, and governments.

Insurers undoubtedly differ in their values, objectives, market power, and resources. In order to accommodate these differences and promote diversity, any insurer wishing to develop a fee schedule should be able to modify the relative cost scale to suit its own perceptions of services' relative values. Rather than trying to force broad agreement over relatively subjective issues, we are proposing a process that permits multiple relative value scales and multiple fee schedules.

Obviously, this approach is predicated on the assumption that the current U.S. system of multiple and diverse insurers and payment methods will continue. If a more uniform "national" health insurance system, as in Canada and most European countries, were a likely prospect for the U.S., then the need for multiple relative value scales and fee schedules would be much less. Whether a uniform fee schedule, applying to all people and all physicians in an area, is better than multiple payment systems is an issue that goes beyond the scope of this paper.

For the great majority of physicians' services, underlying costs, benefits to patients, and insurers' goals and objectives, etc. are unlikely to change very rapidly. Therefore, relative cost and relative value scales would not have to be modified very often. However, insurers' budgets, rates of inflation, and market conditions generally do change from year to year. The multiplier phase of the process seems best suited for annual adjustments to both absolute and relative fee levels.

The paper concentrates primarily on how Medicare might go about developing a fee schedule. To a great extent, however, much of the process could be adopted by Medicaid programs and private insurers. There are obvious economies of scale in developing the relative cost scale. But once available, even small insurers could adopt it as a basis for building a fee schedule.

Over time, the key question insurers should ask in evaluating their fee schedules is whether they get value for money. In other words, are their beneficiaries receiving an appropriate mix and quantity of services? Is access to care acceptable? Is quality acceptable? How do these factors change as insurers spend more or less, by altering both absolute and relative fees? Note that in asking and trying to answer these questions, measuring and knowing the underlying costs of production are relatively unimportant. Rather, insurers need to know what they want and whether they are getting it.

The paper's next section discusses at greater length why production costs should not be the central element of a fee schedule. Nevertheless, constructing a relative cost scale is a logical starting point. The following sections describe some options for measuring costs and constructing the relative cost scale. We then discuss the next two steps of the process, modifying the relative cost scale to become a relative value scale and applying monetary conversion factors to construct the final fee schedule. We then make some suggestions for an organizational structure to implement this process, using HCFA and Medicare as the primary example.

The paper's last section touches on several issues that are critical to an overall system for paying physicians, but lie outside the central focus of this paper. These include the debate over reimbursement of "cognitive" as opposed to "procedural" services; possible bridges between market and competitive forces and the essentially regulatory process implicit in a fee schedule; and the conflict between a single fee for a service and inevitable variations in the quality and complexity of the underlying service, as well as patients' demands for quality, convenience, and amenities.

B. WHY COSTS ALONE ARE NOT ENOUGH

Many who share Congress' unease over market-generated fees would like to see them replaced by a fee schedule. But how should these fees be computed? There is considerable sentiment for basing fees on the cost of the resources used to provide each service, in the belief that resource costs are intrinsically more fixed, less manipulable, and less subject to distortion than fees.

While intuitively appealing, this belief is untrue. In general, the efficient cost of production varies with circumstances--the prices of the inputs, especially physicians' time, used to produce the service, and the scale of production, to name two. Nor is the cost of production independent of the demand for the service, insurance coverage, or patients' preferences. Where many people have insurance coverage, physicians may choose a more expensive mix of inputs by using more of their own time and less time of nurses and aides. Where people place a high value on convenience and short waiting time, they might prefer, and be willing to pay for many small-scale physicians' offices, even though these practices might be more costly than a large, centralized practice with many physicians and long travel or waiting times.

Once it is accepted that there are many ways of combining inputs efficiently, depending on circumstances, then resource cost is no longer a fixed yardstick. It too is a variable substantially under the control of physicians who, obviously, make most of the decisions about how to combine inputs to provide physicians' services.

There is a second critical reason for not basing fees solely on physicians' resource costs. Very simply, resource cost is not and should not be the only factor determining what a service is worth. For one thing, production costs to the physician may bear little relationship to total costs associated with provision of a particular service. External costs include such things as hospitalization costs, home care costs, time off from work or school, and the value of patients' time. Even more broadly, society may bear substantial nonmedical costs, such as lost work, lower productivity, and disability payments, which are affected by medical care outcomes. For example, a procedure with a high unit production cost such as kidney transplant may in the long-run result in reduced health spending in relation to an alternative treatment, lifetime repeated dialysis, which has a lower unit cost. A liver transplant performed on an infant with biliary atresia may involve roughly the same surgical time and effort as a liver transplant on an aged adult with severe cirrhosis. Based on a calculation of production costs, the surgeon would be paid the same for performing the operation. The value to society of the two operations would be dramatically different.

Resource costs also tell us nothing about the efficacy of a procedure, its benefit to the patient, or its potential risks and side effects. Clearly, we should not be willing to pay very much for a service that does not work, regardless of how much it costs. Similarly, in setting fees for two procedures of equal costs and equal benefits, but different risks to the patient, we would probably want to pay less for the more risky procedure.

In some cases, public officials and private insurers may want fees to deviate from costs in order to help achieve broader social goals. Changing physicians' geographic or specialty distributions are two possible goals that can be influenced by how fees are set. Promoting the use of effective preventive health care services is another.

For all of these reasons, then, resource costs should not be the sole basis for a fee schedule. Nor should all fees necessarily bear the same relationship to costs. Why, then, is there so much interest in a fee schedule based on resource costs?

There seem to be two reasons. First, some people implicitly interpret the statement "relative fees are out of line" to mean that fees are out of line relative to costs. Some fees are high relative to costs (or to the amount of time physicians put into the service), while others are low. Therefore, it is argued, getting relative fees back into line requires finding out the cost of each service and pegging the fee to it. Second, many of those who interpret out-of-line more broadly, to include benefits and risks, for example, believe that resource costs are the only concrete base from which to build fees. Other factors are too difficult to define and measure.

A potential way around the problem of relying only on cost data to set fees lies in a different interpretation of "relative fees are out of line." Rather than focusing on the relationship of fees to costs, payers' primary concern should be the relationship between fees and outputs. To say that the fee for an office visit is too low relative to that for a cardiogram, or a proctosigmoidoscopy, or a hernia repair should be interpreted to mean that the payers' beneficiaries are either not getting enough office visits or getting too many cardiograms, proctosigmoidoscopies, or hernia repairs. Will paying more for office visits and less for cardiograms result in more office visits and fewer cardiograms? Is this a better mix of services for the insurers' beneficiaries? Can beneficiaries get the same quantity and quality of care at a lower fee? Viewing the problem as not getting value for money implies that insurers should concentrate more on what they get for their payments and less on how physicians combine inputs to produce services.

To some extent, of course, this perspective on the physician payment issue begs the question, since it doesn't solve the problem of what's the "right" quantity of services. But there is an important difference between trying to evaluate quantities of services and trying to identify the "true" cost of production. Quantities of services, unlike production costs, physicians' time, and input prices, can be easily and inexpensively measured. Assuming the use of a uniform and detailed procedure coding terminology, like CPT-4 or HCPCS, information on quantities for specific services can be generated as a by-product of the claims payment process in a fee-for-service system.

Suppose, for example, that relative fees are changed by increasing the fee for office visits. Do beneficiaries receive more office visits? Do they get fewer diagnostic procedures and surgical procedures? If the quantities of some procedures are thought to be too high, then those fees could be lowered. If the costs of a procedure fall over time so that it becomes more profitable, then its volume is likely to increase more rapidly than the average for other procedures. This would signal the insurer that the fee may be too high. Ultimately, both relative and absolute fees could be manipulated to produce volumes of care consistent with both budgetary constraints and good medical care.

Access indicators can also be generated from claims data. In the Medicare program, for example, changes in the proportion of claims for which physicians accept assignment will be a signal of beneficiaries' access.*

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*As of October 1, 1984, physicians must choose between accepting assignment for either all or none of their Medicare claims. If this becomes a permanent feature of the Medicare program. then the proportion of physicians choosing to accept assignment always would be the relevant access indicator.

Another will be the distribution of Medicare Part B services across physicians' practices. If physicians begin to find the Medicare fee schedule unacceptably low, then Medicare patients will probably become increasingly concentrated in low-cost practices, since only those practices will find that Medicare fees cover their costs.

The primary implication of this discussion is that the "right" price from the insurers' point of view need not bear any direct relationship to underlying costs. If providers are willing to supply as many services of a given quality and convenience as insurers and patients want <u>at the price they are offering to pay</u>, then the price is fair. Insurers may want to take costs into consideration in establishing fees, especially to guard against paying too much for a service. But, there is no inherent reason why all fees should be a uniform percentage of costs.

Although the costs of providing services need not be the central element of a fee schedule, they probably should still be part of the construction process. There are three reasons. One is that the degree of competition among physicians is likely to vary by type of service. For some services, such as office visits, competition may be very stiff, with patients exercising considerable shopping behavior. For other services, such as tests or procedures performed <u>after</u> a patient has selected a physician or begun a course of treatment, the physician may be a virtual monopolist. In other words, the patient may have little or no price sensitivity at this point.

Monopoly power may create incentives to provide services that are not needed, which is another way of saying that the quantity of the service is too high in the aggregate. However, whether or not the services are medically justified, the physician may also be able to charge a price higher than the price that would prevail in a competitive market. In other words, monopoly power can create monopoly profits, which insurers probably have little desire to pay. Having information on costs may be one way of identifying where monopoly profits exist.

Even here, though, cost data are not essential. If the insurer paid less for a service and physicians did not respond by reducing quantity or quality, then one could infer that there were monopoly profits and that the insurer had been paying "too much." Over time, physicians' incomes would fall and this would probably influence the future supply of physicians. But unless such changes affected quantity, quality, or access to service, insurers should not pay more than they have to.

The second reason for using cost data is that for some services, especially those involving new technologies or rapidly changing technologies, charge and quantity data may not be very reliable indicators of whether the fee is too high or too low. Charges may not adjust very rapidly to changing costs, and quantities may be influenced by the new technological and clinical capabilities of a procedure, as well as by its profitability. Under these circumstances, cost data could provide useful additional information for deciding how much to pay for a service.

The third reason for including cost information is that the process of setting a fee schedule, especially for Medicare, is inevitably political. Since many people believe that costs should be involved, beginning with cost data may be an important step in building broad political support for a fee schedule. Information on relative costs could be the starting point from which insurers make modifications based on factors other than costs. These modifications would amount to constructing a relative value scale from a relative cost scale. The relative value scale would then be converted to a fee schedule by applying monetary multipliers or conversion factors which translate a procedure's relative value into a fee measured in dollars.

C. A THREE-STEP PROCESS

Based on the above considerations, we propose a three-step process for developing a fee schedule. The first is constructing a relative cost scale. (We discuss below three approaches to identifying cost data.) This first step would be broad based and could involve providers, public and private insurers, financial managers, researchers, and government officials, for example. It would be a relatively technical and objective process whose goal is to identify the resource underpinnings of the production of physicians' services. Although judgments and assumptions are inevitable even at this stage, they would be limited as much as possible to technical issues rather than value issues in order to promote consensus among participants. The resulting relative cost scale would be publicly available to all--providers, insurers, administrators, patients.

In the second stage of the process, individual insurers would apply their values, objectives, and assessments of benefits, risks, efficacy, external costs, etc., to convert relative costs into relative values. In other words, the underlying concept of value would be very broad and very subjective. Because many of the factors which influence assessments of value are subjective, they are very difficult to measure. Furthermore, insurers are likely to have legitimate differences in goals and objectives. Thus, trying to make this step of the process broad-based, like the construction of the relative cost scale, is probably neither feasible nor desirable. Rather, each insurer or group of like-minded insurers need to impose their own (and possibly their beneficiaries') goals, values, and assessments to construct relative values.

The last step of the process would be developing and applying monetary conversion factors to the relative value scale to produce the final fee schedule. Budgetary considerations are likely to be paramount in this step. Presumably, conversion factors could be adjusted annually, while underlying relative values and relative costs would need to be changed less frequently. Over time, relative fees could depart from relative values as insurers "fine tune" fee schedules by adjusting conversion factors in response to both changes in budgetary constraints and their monitoring of the quantity, quality, and access to services.

Separating the development of the fee schedule into these three steps is, of course, arbitrary. The second and third steps could be collapsed into one, for example. Nevertheless, approaching the construction of a fee schedule as a multi-step process has several advantages. It permits flexible implementation by individual insurers. It recognizes that different types of expertise are required at each phase, that some issues are essentially technical while others are essentially political, and that modifying scales and fees for either technical or political reasons involves different procedures.

Agreeing to start with a relative cost scale provides the potential for relatively easy updating of scale values as new technologies develop to change the production costs of a particular service or procedure. Since other costs, social goals, and preferences may not be affected by changes in costs, modification of the cost scale over time could be treated as a technical task, which does not need to consider less objective and, perhaps, less stable broader social consensus. Similarly, individual insurers could alter relative values as their preferences or objectives change without having to deal with the issue of procedures' costs. Likewise, conversion factors could be adjusted through routine administrative procedures without having to tamper with either relative values or relative costs, which are likely to be more stable than budgets and inflation rates.

The remaining sections of this paper describe the steps of this process in more detail. How can cost information be obtained? How can the relative cost scale be converted into a relative value scale and then a fee schedule? What type of organizational structure might be able to implement these processes?

1. Constructing a Relative Cost Scale

Starting with the task of constructing a relative cost scale may make the job of developing a fee schedule easier, because benefits and values don't have to be considered at this stage, but not necessarily easy. Measuring costs directly seems straightforward, but is in fact extremely difficult, costly, and probably not very reliable. One of the key cost elements, the value of the physician's time is not easily observable. Capital costs are also difficult to measure, difficult to allocate among procedures, and depend critically on how unused capacity is valued. Finally, data would have to be collected over an extremely large number of sites and situations to obtain enough observations for constructing cost estimates that would be reasonably reliable. In general, direct measurement of costs for all procedures seems neither feasible nor desirable.* At most, detailed cost studies should be done only for a limited number of procedures to establish benchmarks for larger classes of procedures.

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*See J. Wagner, "The Micro-Costing Approach," in J. Hadley et al., "Alternative Methods of Developing a Relative Value Scale of Physicians' Services: Year 1 Report," Urban Institute Project Report No. 3075-04, February 1983, for a more detailed discussion of methods of measuring costs directly.

The primary alternatives to measuring all costs directly are (1) assuming that costs are proportional to physicians' time inputs and measuring those directly, or (2) using some type of consensus development process to estimate costs from other data. We first discuss a well known example of the former, developed by Hsiao and Stason.* We then propose a method which starts with data on charges and relies primarily on physicians' and other experts' judgments of which procedures are money makers and which are money losers to "back into" estimates of average costs.

a. Resource Costs Based on Time: The Hsiao-Stason Method

Basing relative costs solely on relative time inputs is not very desirable because other costs are not uniformly related to physicians' time input and because not all physicians' time is of equal value.** Recognizing these limitations, Hsiao and Stason developed a method of developing a relative cost scale that is fundamentally based on time, but recognizes that the value of time and the cost of the procedure varies with "...the intensity of effort and degree of skills represented by this time, the physicians' level of training, and the overhead expenses incurred in providing the service.*** (Their method was recently implemented by the Massachusetts State Rate Setting Commission to modify Medicaid fees for a number of physicians' services. See Chapter II below.) The estimated relative cost of a procedure is computed as a multiplicative function of time, complexity per unit of time, a factor representing

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*W. Hsiao and W. Stason, "Toward Developing a Relative Value Scale for Medical and Surgical Services," HCFA Review (Fall 1979).

**See J. Hadley, "Time-Based Methods," in J. Hadley et al., "Alternative Methods of Developing a Relative Value Scale," and J. Hadley and D. Juba, "Relative Value Scales for Physicians' Services," HCFA Review (forthcoming) for more detailed discussion of time-based approaches.

***Hsiao and Stason, "Toward Developing a Relative Value Scale," p. 24.

the differences in the opportunity costs of training among specialties, and differences in overhead expenses.

The Hsiao-Stason model, which they acknowledge needs to be refined and updated, is based on two types of assumptions. One set consists of assumptions made because of the lack of data. These are amenable to empirical testing and updating. For example, actual time per procedure had to be estimated from existing limited data sources and professional judgments. These estimates can be refined by maintaining logs, performing time-motion studies, or surveying more clinicians to obtain time estimates. Similarly, more data on overhead by specialty can be obtained to improve their estimates of relative overhead expenses by specialty group.

The other set of assumptions are not amenable to empirical testing and call into question the validity of the model. Another group of researchers or practitioners might have made substantially different judgments regarding these assumptions and, therefore, come up with a quite different result. While there are other examples that might be cited, we will comment on three assumptions that might be challenged and yet defy external testing.

First, the method gives prominent weight to the complexity factor, based on the notion that not all physicians' time is of equal value. It constructs complexity scales from judgments of panels of experts, using a modified Delphi technique. The range of relative complexities varied widely from one specialty to another. Yet the authors standardized the range of complexities to that of general surgery. The basis for this standardization was the assertion that there is a widespread consensus among physicians that the most complex procedure in one specialty is comparable to that in another, given an equal length of residency training. In effect, they assumed that the wide differences in professional judgment by specialty about the scale of complexity values do not represent true differences between specialties.

This assertion is certainly open to challenge. Even assuming it is correct, based on the proviso that lengths of residency training are equal, how does one adjust for complexity based on different lengths of training? If neurosurgery training is twice as long as obstetrics-gynecology training, should the complexity scale between the simplest and most complex procedures be twice as wide? In short, there is no objective basis for setting or standardizing the range of complexity values across specialities.

Second, the authors determine the final cost-based relative values as a multiplicative function of the four separate factors of time, complexity, opportunity cost, and overhead. They also provide an alternative computation by weighting the resource cost variables before combining them. There is no intuitive or empirically-based reason for the weights given to the various factors. Physicians in primary care specialties might logically argue that time should be given greater weight in the calculation, while subspecialists might logically argue that complexity (the factor which represents skill and effort) should be given the most weight. Since there is no compelling rationale for their decision to use a simple multiplicative formula, there is no reason to believe that this assumption would not be subject to substantial controversy in any attempt to establish a national relative cost scale. Again, further data collection is not likely to alter the fundamentally subjective judgments of how to value time, skill, and complexity.

The third major assumption that raises doubt about the reliability of this method is that overhead expenses by specialty group are spread equally over all services performed. As discussed in Wagner (1983), in most areas of health care, particularly equipment-intensive areas, non-physician personnel and equipment are important inputs into the production process.* Proper allocation of labor and overhead costs depends upon micro-costing techniques that are quite expensive and, by design, directly relevant only to the specific location in which the study is conducted. For the laboratory, radiology department, and even many office-based specialities the assumption that overhead should be allocated equally over all services performed would result in calculated resource cost values that bear little relation to true production cost. Even with the easiest group of procedures--surgical procedures--that Hsiao and Stason considered, this assumption may not be reasonable. Overhead to the physician for hospital-based procedures might be negligible, whereas overhead for office-based procedures might be substantial since the physician pays the salaries of assistants and provides necessary equipment. A relative cost scale that does not distinguish between hospital and office overhead would then systematically and inappropriately upgrade the value of hospital procedures relative to office procedures.

Calculation of their opportunity cost multiplier provides additional examples of the number and kinds of assumptions needed: each specialty earns the same rate of return on its investment in training; variations in hours of work are unimportant; the appropriate discount rates are 7 or 10 percent; residents' salaries increase at 15 percent per year after the first year of training; a general practitioner's average income is the relevant measure of foregone earnings while in training. Again, variations in any of these assumptions would alter the estimates of opportunity costs and subsequent relative costs.

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*J. Wagner, "The Micro-Costing Approach," op. cit.

In summary, the Hsiao-Stason model attempts to determine the relative values of procedures and services on the basis of resource costs, a reasonable and useful concept for setting a relatively objective and stable scale which can be used as part of setting actual fees. Unfortunately, the method does not allow us to get around the realities that measuring costs is very difficult and many assumptions have to be made. Even when attempting to base a relative value scale on resource costs, the process is fundamentally a judgment-laden task for which there is no objectively correct solution. Developing a formula for calculating relative costs gives the appearance of removing judgment from the process, but in fact does not remove judgment from either the construction of the formula or the measurement of what goes into it.

b. Resource Costs Estimated From Charge Data and Physicians' Judgments of Profitability

We suggest an alternative approach to constructing a relative cost scale based on modifying a scale constructed from relative charges. The key feature of this approach is that it starts with data on average charges for services. Rather than trying to collect cost data de novo and allocate them to specific services, we ask physicians to consider whether a particular service is a relative financial "winner" or "loser," taking into account limited data from cost studies, and perceptions and estimates of profit margins for specific services. This approach does not purport to be a purely objective, politically-free method. Rather, it attempts to achieve consensus primarily within the medical profession on the relative costs of procedures and services.

The key question implicitly posed by this approach is, when taking into account all of the factors that are relevant to valuing the cost of providing

- Relative values do not seem to be extremely sensitive to variations in insurance coverage, though absolute fees are higher where there is more insurance coverage.*

- A relatively small number of the nearly 6,000 CPT-4 procedure codes accounts for the great majority of physicians' services. (In California, fewer than 500 codes accounted for more than 90 percent of physicians' services to Medicare.**

Given these premises, the first step of the process would be to assemble a charge data base. (A uniform procedure coding terminology such as either the AMA's CPT-4 or HCFA's Common Procedure Coding System (HCPCS), which is nearly identical to CPT-4, would be needed to identify procedures.) The data could come from a sample of charges submitted to HCFA beneficiaries, supplemented by samples of charges submitted to Blue Shield plans and commercial insurers, especially for services not heavily used by HCFA beneficiaries. Because charge-based relative values seem to be very similar even when computed from different data sets, the specific sampling strategy may not be especially critical. Two criteria which could be followed are that (1) the distribution of claims for a service reflect the geographic and specialty distribution of the physicians providing that service and (2) infrequently performed services be oversampled so as to achieve some prespecified standard of sampling variability.

The issues of how charges compare to costs and whether the implicit profit from performing a set of procedures is equal or not can best be addressed by physicians familiar with the practice of those procedures. Thus, the first pass at the goal of identifying zero-profit charges, which by definition would be approximations of average costs, should be made by subsets

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*See Chapter IV below.

**See Chapter III below.

a service--time, skill, time of day, riskiness, discomfort, stress, overhead, etc.--what fee for each service would leave the decision to perform it or not independent of financial return? What fee would just cover their costs and provide them with zero profit? In effect, these questions seek to identify, using Pauly's phrase, the "incentive neutral" set of physicians' fees.* Pauly has argued that if physicians are financially indifferent in deciding among alternative ways of treating a patient, they will be more likely to choose what's best for the patient. Incentive-neutral fees reduce the odds of a conflict of interest between physicians' financial incentives and patients' medical and financial welfare. In this particular context, seeking the fees which set the net financial profit to zero is equivalent to identifying procedures' average costs. (If the ultimate fee schedule turned out to be a uniform percentage markup above average costs, then it would indeed be incentive neutral. As discussed below, however, different insurers may have various reasons for wishing to depart from incentive neutrality.)

Prior research on relative value scales suggests several other reasons for starting with charge data.

- Relative value scales built from charge data are largely invariant with respect to the charge data used or the method of calculating a representative charge for each service.**
- Relative value scales built from charge data appear to be reasonably constant over a five-year period, even though absolute fee levels grew dramatically.***

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*M. Pauly, Doctors and Their Workshops (Chicago: University of Chicago Press, 1980), pp. 57-63.

**D. Juba, "Charge-Based Methods," in Hadley et al., "Alternative Methods of Developing a Relative Value Scale," op. cit., and Chapter I below.

***Ibid.

of physicians from the same or closely related specialties. Anesthesiologists should evaluate anethesiology procedures, opthalmologists should evaluate eye services, obstetrician-gynecologists should evaluate obstetrical and gynecological services, etc.

An initial relative charge scale for all procedures would then be constructed from the assembled charge data base. One procedure could be selected as the base or numeraire against which all other procedures would be compared. However, it may be preferable to divide procedures into relatively homogenous groups for the purpose of subsequent examination and analysis, and to select a separate numeraire for each group.

Most existing relative value scales identify five procedure groups: medicine, surgery, radiology, pathology, and anesthesiology. However, this may be too broad for the purpose of determining zero-profit charges within a class of procedures. Since considerable emphasis will be placed on physicians' judgments about implicit profits, given data on charges (and some cost information), it may make the most sense to start by grouping major specialties and subspecialties on the basis of the similarity of procedures predominantly performed by each group of specialties. The number of groups should be large enough to keep the range of procedures within a group relatively homogeneous, but not so large as to make the process unmanageable.* For example, family practitioners, general practitioners, and general internists could be considered one group. General surgeons could be a separate group, or implicitly incorporated into several surgical specialty groups. Whatever, the final number of groups, one of the most frequently performed

*The Graduate Medical Education National Advisory Committee established 31 specialty-specific panels to estimate physician requirements by specialty (Graduate Medical Educational National Advisory Committee, 1981, p. 63).

procedures in each group should be chosen as the numeraire for that group. (As has been shown elsewhere, separate scales for subgroups of procedures can always be combined into a single scale as long as the relative value relationship among the numeraire procedures can be determined from the underlying charge data.)

After allocating all procedures among the specialty related groups, those most frequently performed in each group would then be selected for further, more detailed analyses. This group of frequently performed procedures would be chosen in part to represent families of procedures within the specialty-specific group, each with its own relative charge scale. A sample of relatively new procedures or procedures experiencing rapid technical change in how they are performed might also be examined. (These could be selected by a committee of physicians and insurers familiar with recent changes in medical practice.) On average, each specialty group might consider 10 to 15 procedures, some of which would be reviewed by more than one specialty group.

In each case, the question faced by the physicians (and other panel members) would be:

> "Taking into account your training, the skill and effort required to perform the procedure, the amount of time required and the costs of other inputs for which you are responsible, what charge or fee would _just_ cover these costs and the value of your time? How does this _zero-profit_ charge compare to the current average charge used to compute the initial relative value scale?

What information would be needed to tackle these questions? Obviously, whatever cost information is available from prior studies should be collected and made available. It may also be useful to commission a small number of detailed cost finding studies, covering perhaps one or two procedures in each procedure group. Although these studies would not be able to solve the problem of the proper valuation of physicians' time or the allocation of capital and other overhead costs, the information they generate might be a useful benchmark for finding the zero-profit charge for some procedures.

Included within each panel's set of procedures should be one or two visit procedures, a routine office visit and a routine hospital visit, for example. Again, physicians would be asked what charge would just compensate them for the time, skill, and costs involved in providing visits to patients they normally treat in the course of providing the other frequently performed procedures associated with their specialty. Since the value of time depends in part on how busy a physician is, all panel members would be instructed to base their estimates on the assumption that the physician is fully occupied and does not have any slack time. This assumption is necessary to standardize estimates across individuals and across panels.

Depending on the resources available to construct the relative cost scales, each iteration of moving from the initial average charges to estimates of zero-profit charges could involve both face-to-face deliberations of a relatively small group of experts and opinions of a much larger group surveyed by mail. Group dynamics and panel structure could be important factors and would need to be considered carefully.* Reaching agreement on the set of zero-profit charges may not be easy. But it should be feasible because of the homogeneity of the panels assessing the data and because of the iterative process of comparing average charges for a small group of procedures and asking which are very profitable, which are barely profitable, and which are unprofitable. With the aid of cost data and the experience of practicing physicians who routinely perform and bill for these services, it should be

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*See R. Berenson, "Group Decision-Making Methods," in Hadley et al., "Alternative Methods of Developing a Relative Value Scale," op. cit.

possible to arrive at a set of charges which would make the procedures equally profitable in terms of their financial impact on physicians.

The outputs of these panels would be a revised set of zero-profit average charges which could be recombined to form, in effect, a relative cost scale. Two further steps would remain to be taken. The first would be resolving differences across panels in the valuation of common procedures, especially the two visit procedures. The second would be to extrapolate from this relatively small set of, say, 200 services to the remaining services identified by the procedure coding terminology.

Implicitly, each panel's or specialty's evaluation of the zero-profit charge for an office or hospital visit should be a good index of how each specialty values its time, based on length of training and skill levels required to perform nonvisit procedures, and estimates of how much the physician could earn in providing those alternative procedures.* In economics, the latter concept is known as "opportunity cost"--the cost of time a physician spends on an office or hospital visit is the amount the physician could earn if that time were spent in the most profitable activity the physician might otherwise undertake. Obviously, estimates of opportunity costs depend on how fully occupied physicians are. If there are more physicians than patients available, then the opportunity cost of a visit may be very low. If physicians are very busy, then opportunity cost would be high. Thus, aside from length of training and skill issues, the degree of excess capacity (or excess demand) should be taken into account. As suggested above, for the purpose of imputing the cost of a visit, it may be necessary to instruct all panels to assume that physicians are working at full capacity.

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*Variations in the costs of inputs other than physician time in providing an office visit or a hospital visit should be accounted for separately.

Suppose that one specialty panel values the cost of, for example, a fifteen minute office visit at $30 while another values it at $15. Is this difference in some sense "right?" Should interspecialty differences in the cost of a visit be preserved? Taking the second question first, in principle, the answer should be, "Yes." There are real differences in the cost of time due to differences in training, skills, and other opportunities, and there is no reason why these cost variations should be treated differently from variations in the costs of equipment or ancillary personnel used.

In practice, it may be difficult to recognize these differences very precisely. Physicians can designate themselves as practicing one or more specialties, and many specialists may spend nontrivial portions of their time providing routine or general care not related to their primary specialty, i.e., medical and surgical sub-specialists may also practice general internal medicine and general surgery. In other words, when a better trained and more skilled physician provides <u>exactly</u> the same service as a less well trained and less skilled physician, the case for differential payment based on training and skill is not so strong. In fact, there may be no way that a fee schedule which is uniform across all specialties can distinguish between these two situations by itself.

Are differences in panels' time valuations "right?" One way to check would be to compute specialty-specific estimates of each specialty's economic rate-of-return to training.* Although standards change over time, a reasonable presumption is that basic specialty training currently requires three years of training after medical school. Taking this as a benchmark, how much more do physicians earn as they increase their training to four, five, or

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*See R. Lee and C. Carlson (1981), for example, of a detailed analysis of rates of return.

six years? Are there differences in earnings for specialties with the same length of training? How do extra earnings compare to the cost of extra training? (Cost of training consists primarily of opportunity cost--the difference between the physician's earnings as a fourth, fifth or sixth year resident and what the physician would have been earning if he or she had completed training after three years.)

If after converting extra earnings and extra costs of training to base year dollars,* the two just about balance, then this would mean that differences in the value of time just offset differences in the cost of training. From an economist's point of view, the "market" for physicians in different specialties would be in equilibrium, with no strong financial incentive for physicians in training to seek or reject additional years of residency training.

If extra earnings exceed extra costs, then two conclusions could be drawn. Perhaps extra training brings with it extra monopoly power--more specialized physicians are less subject to competition from other physicians and are able to charge higher fees than would prevail in a competitive market. Alternatively, specialties that require extra training are in short supply and, as a result, these physicians are able to charge a premium for their time. The former might justify some compensatory action in setting the cost of time, since there doesn't seem to be any good social reason for physicians' extracting monopoly profits. The latter may not call for adjust-

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*Because the financial return from extra training occurs in the future compared to the cost, the dollar totals are not directly comparable. This situation is analogous to the fact that $100 today is worth more than $100 one year from now, since today's $100 could be put in the bank and earn interest. The process of converting future dollars to base year dollars is called discounting. An important and largely arbitrary issue is the choice of the rate at which to discount future dollars.

ment, however, since the higher return to advanced training should act as an additional incentive for some physicians to seek extra training and relieve the apparent shortage of specialized physicians. Since most people believe that currently there is a surplus of physicians in many specialties (See GMENAC Report, 1981), differential rates of return would probably be attributed to differences in monopoly power.

For the purpose of setting relative costs, it may be useful to find the cost of time that in effect equalizes the rate of return to additional years of training and across specialties. This is equivalent to assuming that the existing mix of physicians by specialty is the right one, i.e., relative surpluses or shortages are the same for all specialties, and that differences in rates of return are due to monopoly power. (An alternative might be to use the GMENAC report's assessment of surpluses and shortages by specialty.) Estimates of the cost of physicians' time generated by each panel of physicians could then be adjusted up or down so that the implicit rate of compensation per hour would be consistent with the assumption of equal rates of return to training across specialties. (Obviously, different assumptions would lead to different adjustments.)

Differences would still exist across specialties and how to incorporate these differences into the cost of a visit would still have to be resolved. One approach would be to take a weighted average, where the weights are based on each specialty's share of all visits. Another is to recognize different costs based on length of training, for example 1 to 3 years, 4 to 5 years, and 6 or more years. The latter would come closer to recognizing differences in true costs, but would be more cumbersome in that it would add another dimension to an already long list of procedure codes.

Assume for the sake of example that the set of 200 study procedures had been allocated among 15 panels, each of which was composed primarily of physicians in the same or related specialties. Each of these 15 panels produced an estimate of the zero-profit charge for a routine office visit and a routine hospital visit. These estimates were used to impute estimates of the value of time for the specialties represented on each of the panels. This set of presumably 15 different estimates would next be collapsed into 3 sets, based on the adjusted time values for specialties grouped by length of training under the assumption that the return to training should be equal across specialties.

Using these estimates of the value of time as anchors, the process would then work backwards to construct a relative cost scale which would be based on average costs imputed primarily from information on average charges and estimates of relative profitablity. In each of the 15 panels of procedures, the average value of the two visit codes would be adjusted to reflect the average value of time assigned to physicians in the specialties represented by those procedures. Each of the other procedures in the panel would then have its average value adjusted so that the relative valuations produced by the panel would be preserved. For example, suppose that opthalmologists judged a cataract extraction to be worth 25 times a routine office visit and that their estimate of the cost of time in a routine office visit was $40. (Based on existing average charges, a lens extraction is worth approximately 30 times an intermediate office visit with an established patient.) This would imply that the zero-profit charge or average cost of cataract extraction was $1,000. Suppose that the process of adjusting the value of time across specialties led to a revision of the average cost of an office visit to $35. In order to preserve relative values within the panel, the average zero-profit charge for a cataract extraction would be reduced to $875.

After making such revisions within each panel's set of services, the average zero-profit charges for all 200 services would be used to construct a single relative cost scale that would recognize both differences in the value of time across specialties and differences in the broadly defined costs of spending time with a patient and performing diagnostic or therapeutic procedures that involve either surgery or the use of equipment. To revamp the relative costs of all of the procedures identified by the procedure coding terminology, these 200 procedures could be used as benchmarks for their families of related procedures. For example, suppose that cataract extraction was the representative procedure of the family of all eye surgery procedures. From the initial charge data base it was possible to create a scale based on relative charges for all of the procedures in this family. If it is assumed that this set of relative values is a reasonably accurate measure of relative costs within the family, then they can be applied to the revised relative cost for all eye surgery procedures. Although judgments would have to be used in defining families of procedures, it seems that the procedure codes which are responsible for most of the spending for physicians' services could be reasonably allocated.

2. From a Relative Cost Scale to a Fee Schedule

The output of the first step of the process would be a set of relative costs based on the estimates of the average cost of providing each service, derived from average charges, limited cost information, and experts' assessments of each service's profitability. As noted at the outset of this discussion, resource cost is not the only factor which should be taken into account in constructing a fee schedule or a relative value scale. Three major questions need to be addressed. First, should relative values be the same as relative costs? Second, should relative fees be identical to relative values? Third, how generous should fees be? In other words, relative fees could be the same as relative values with a fee of $20 for an office visit or $40 for an office visit. The latter would obviously be twice as generous as the former.

Although a relative value scale and a fee schedule are closely related, they need not be identical. A relative value scale is a cardinal ordering of the services physicians provide. Services are identified by a procedure coding terminology such as CPT-4. The number assigned to each service indicates its worth or value relative to other services in the scale. The unit values assigned to the scale are completely arbitrary. In other words, the base or numeraire service could be assigned a value of 1, 10, or 100 without any loss of information, as long as services that are valued or rated twice as high as the base service are assigned values of 2, 20, or 200.

The numbers assigned services in a relative value scale are not necessarily dollar values or fees. To create a fee schedule from a relative value scale, one assigns a monetary value to each relative value scale unit. If the monetary value were $1, then the relative value scale would be identical to a fee schedule. But a fee schedule could also be created by applying a conversion factor of $1 to some services, $2 to others, and $10 to still others. In this situation, the fee schedule does not preserve the cardinal ordering of the relative value scale.

Since the relative value scale and the fee schedule actually used to pay for services should reflect primarily payers' preferences, values, goals, and budget constraints, we believe that these two parts of the process should be controlled primarily by insurers. Unlike the underlying costs of production, which all payers face on essentially equal terms, values and budgets will differ among insurers. Therefore, different insurers, Medicare, individual Medicaid programs, Blue Shield plans, and commercial insurers should be free to make different decisions about how to move from the relative cost scale to a relative value scale and a fee schedule.

Allowing different insurers to pay different amounts to the same physician for the same service creates incentives for physicians to prefer high-paying insurers' beneficiaries over other patients. In other words, access will be best for people insured by the highest paying plans and for people willing to supplement insurers' payments if they are less than the full amount charged. The current system of paying for physicians' services allows both kinds of variations. If complete equity of access on financial terms were also a national goal, then uniform fees for all insurers and all patients (in the same geographic area) would be called for. A complete discussion of the equity-vs-diversity issue is beyond the scope of this paper.

a. Converting Relative Costs to Relative Values

The primary goal of this phase of the process would be to convert the relative cost scale into a relative value scale which reflects insurers' views of services' benefits, appropriateness for their subscribers, risks, efficacy, and spillover implications to other health care services and costs, such as hospitalization, home care, nursing home care, and prescription drugs. Insurers may have different judgments about whether some services are provided too often and others not often enough based on medical considerations and the characteristics of their subscriber population. For example, the appropriate rate of cataract surgery for aged Medicare beneficiaries is obviously very different from the rate for an employed, privately insured population. Compared to a private insurer, Medicare might wish to pay relatively more for cataract surgery and relatively less for some other surgical procedures thought to be less appropriate for the elderly than for a younger population, e.g., organ transplants or joint replacements. Along the same lines, private insurers may wish to encourage organ transplants for children and discourage them for older subscribers. Or Medicare might want to encourage counseling and comforting care for the frail elderly.

Another factor that should be considered in setting relative values is the efficacy of a procedure. Insurers may wish to pool their efforts, or the government may take the lead in evaluating the efficacy of specific procedures and the relative risks and benefits of related procedures, especially those which are substitutes or competing methods of dealing with the same medical problem--for example, vaginal vs. cesarean section deliveries. Based on the outcomes of these studies, different insurers may have different positions on whether and how much to discourage or promote certain services on the grounds of efficacy, or risks and benefits relative to substitute procedures. Currently, Medicare and Medicaid have only two options: to cover a service either fully or not at all.* A relative value scale and fee schedule system permits them to pay less than full costs for services not yet demonstrated to be fully efficacious. Nonefficacious services would presumably have relative values of zero, i.e., they would not be covered at all.

Insurers may also have very different positions on the tradeoffs between access, quality, and program costs. Private insurers, on the one hand, are probably most sensitive to limits on access and quality, since they compete aggressively among themselves for subscribers, who have the freedom to

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*Private insurers can attain partial coverage for selected services by using higher coinsurance rates, e.g., many policies cover psychiatric benefits at 50 percent coinsurance or as an indemnity payment.

choose. Medicare and Medicaid programs, on the other hand, have more of a "captured" population. Most poor people covered by Medicaid are probably not in a position to purchase private insurance if they are dissatisfied with the quality of care and degree of access Medicaid is willing to buy. Medicare beneficiaries also have limited options to buy out of Medicare, but may have greater political voice than the poor for expressing dissatisfaction with access and quality. How Medicare chooses to respond depends to some extent on how political voice affects Congress' willingness to push for changes in Medicare.

b. Converting the Relative Value Scale into a Fee Schedule

The last step of the process involves applying monetary multipliers to each service's relative value scale number to create the fees which would make up the fee schedule. Many insurers may wish to have relative fees identical to relative values. For them, the monetary conversion factor or multiplier would be identical for all services, e.g., every relative value unit is worth $1. Other insurers may wish to use the fee schedule to further other goals and may have different multipliers for differnt types of services.

In either case, cost to the insurer will be a key, if not the primary factor in determining the value of the multiplier. Public programs must try to live within their budget constraints. Private insurers must find the balance between keeping use, and subsequent premium costs, down without angering subscribers. Different insurers may have different judgments about how to achieve these goals. For example, some may wish to offer plans that pay relatively more for preventive services and office-based procedures and less for hospital visits and hospital-based procedures. Others may choose to keep relative values unchanged, but simply pay less for everything.

A possibly major advantage of separating the monetary multiplier phase from the relative value phase is that it may be both easier and necessary to modify multipliers more frequently than relative values. The medical factors that influence both the relative cost and relative value phases of the process are unlikely to change very rapidly or affect all services all the time. Budgets and rates of inflation do change continuously and do affect all services. If nothing else, multipliers would probably have to be reviewed annually to take account of changes in budgets and inflation.

Adjusting the multiplier also becomes a means of fine tuning or regulating fees in response to changes in the quantity and quality of services and patients' ease of access. As experience builds in monitoring how well the system is working, multipliers can be altered without having to reopen questions of underlying values and costs. This should make both implementation and administration of the fee schedule easier than if every change in fees required a reexamination of both values and costs.

Using fee schedules to influence policy objectives beyond the patient-physician transaction may also affect the choice of monetary multipliers. Insurers will differ on the extent to which they wish to use the fee schedule to help achieve broader social goals, as well as disagree on what those social goals should be. As the largest national payer, Medicare may be able to influence the earnings of physicians in different specialties as a way of influencing specialty choices over the long run. For example, HCFA may decide that there are too many surgeons and not enough psychiatrists. Over time, it could influence young physicians' specialty choices by systematically paying less for operations and more for psychiatric services. Other insurers may feel that they are individually too small a share of the national market to influence specialty choices.

Public insurers, Medicare and Medicaid, may wish to use the fee schedule to influence the geographic distribution of physicians. But different programs may have different objectives. In some states, for example, there may be too few physicians in rural areas while in others the primary problem may be in poor urban neighborhoods. Thus Medicaid programs might want to set different urban/rural monetary multipliers for converting the relative value scale into a fee schedule. Medicare might have national physician redistribution goals--to reduce the gap in the numbers of physicians relative to population between physician-rich and physician-poor states. These goals could affect regional variations in monetary multipliers.

Another option, and reason for separating the conversion factor phase from the relative value scale phase of the process, is that insurers may be able to introduce physician competition and market information into the choice of a multiplier(s).* For example, Medicare might publicize and circulate among physicians its relative value scale. It could then invite physicians and other Part B providers to submit bids containing the minimum monetary conversion factor each physician would be willing to accept. In other words, the relative value scale is a precise definition of the "product" Medicare wishes to purchase for its beneficiaries. Each provider's multiplier identifies the minimum fee schedule providers would accept.

Medicare would then have several options for what to do with the schedule of physicians' multipliers. It could choose a single multiplier, say the mean or median, as the multiplier for that area. It could select all physicians with multipliers below a certain value, say the 75th percentile, and designate them as participating providers and exclude physicians above the cutoff level.

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*We are grateful to Stephen Jencks for suggesting this option.

It could vary patients' cost-sharing obligations depending on whether they obtained care from low cost or high cost providers, e.g., 10 percent coinsurance for care from physicians in the first quartile, 15 percent for the second quartile, 20 percent from the third and 25 percent from the fourth. (Obviously, beneficiaries would have to have information from Medicare on the physicians in each quartile.) Medicare could also manipulate regulations regarding acceptance of assignment, overbilling, and rebates to beneficiaries.

Obviously, none of these approaches has ever been tried, so there is no practical experience from which to learn. Could collusion among providers be prevented? How complicated would the system be to administer? Could the necessary information be made available to beneficiaries in an understandable format and at a reasonable cost? How often would bids be solicited?

If these questions can be answered, either through demonstration projects or perhaps implementation by some Medicaid programs, then this phase of the process, choosing multipliers to convert the relative value scale into a fee schedule, may be a key intersection of regulatory/administrative proceedings and market forces. Many factors may influence the fees physicians are willing to accept: changes in the supply of physicians, competition among health care providers, e.g., through the growth of HMOs and preferred provider organizations, and changes in the demand for care, because of population shifts, unemployment fluctuations, or changes in the extent and nature of private health insurance coverage, for example. The strength of these factors will vary across areas and over time. Regulatory and administrative mechanisms may not be very well suited for identifying these changes. Therefore, some measure of market activity, perhaps through a multiplier bidding process, may be a critical adjunct to the process of setting and updating fee schedules based on relative value scales.

D. SUGGESTIONS FOR ORGANIZATIONAL STRUCTURES

The discussion so far has focused primarily on procedures and methods. What kind of an organizational structure might be suitable for carrying out the tasks described?* The process of constructing the relative cost scale is to be primarily a technical and, to the degree possible, objective exercise whose goal is to produce a scale which ranks physicians' services based on estimates of zero-profit charges, which are in effect equivalent to average costs. This scale would be publicly available.

Given this objective, it seems that a government funded commission or office, which could, but need not, be part of DHHS, should be established. The commissioners, governing board, or advisory board should be broad based, with representatives from public and private insurers, organized medicine, medical practitioners, and the research community. The purpose of this group would be to define and clarify the objectives of the relative cost scale and the factors to be used in its construction, and to review and comment on both the process of constructing the scale, the final scale produced, and subsequent modifications.

The actual construction of the scale would be carried out by a permanent technical staff and a set of subcommittees or panels organized around an appropriate and reasonable number of medical specialties and specialty-specific procedure families. The technical staff would have primary responsibility for obtaining data needed by the subcommittees, for obtaining and reviewing the results of past and ongoing studies, and conducting or commissioning future studies. These studies would presumably concentrate on

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*See R. Berenson, "Group Decision-Making Methods," in Hadley et al., "Alternative Methods of Developing a Relative Value Scale," op. cit., for a more detailed discussion of issues pertinent to organizational structure.

measuring the costs of resources used in producing physicians' services. Special priority should probably be given to the problem of defining and measuring the cost of physicians' time and how it varies with differences in length of training, choice of specialty, and market conditions.

The subcommittees should be composed primarily, though not exclusively, of physicians in specialties that frequently perform the services in each family of procedures. Priority should be given to practicing physicians rather than representatives of organized medicine, with a balance between fee-for-service practitioners, salaried practitioners, and research and academic physicians. Presumably, fee-for-service practitioners would have the greatest stake in the outcome of the process, and their potential conflict of interest would need to be offset by including disinterested physicians. In addition, each subcommittee should include some people with backgrounds in cost accounting, economics, financial management of medical practice, or physician payment. These people could be drawn from insurers, academia, nonacademic research organizations, accounting/management firms, or actual managers of organizations that deliver physicians' services, such as health maintenance organizations, clinics, and hospital outpatient departments.

The subcommittees would start with a charge-based relative value scale for a small number of frequently performed and new procedures, as described above. It would be the job of the technical staff, with the aid of representatives of each of the committees, to select the procedures, obtain the needed charge data, and construct the initial charge-based scale. After each subcommittee completed its conversion of the charge-based scale into a scale more nearly based on zero-profit charges (average costs), the technical staff would be responsible for combining the new scales into a single scale and extrapolating it to the full list of procedure codes.

Written documentation and explanation of reasons for and methods used to make major changes between the initial charge-based scale and the final scale ought to be part of the record and output of the technical process. The subcommittees could then be given the opportunity to review the final relative cost scale and, possibly, to debate and make further modifications. This would be a cross-subcommittee, and thus interspecialty, review.

It is at this point that major differences among specialties in estimates of the value of physicians' time and the costs of various procedures might emerge. Special attention would have to be given to structuring the process to avoid "capture" by self-interested parties and to promote consensus or majority approval.* After review by the subcommittees and possible revisions by the staff, the full scale, with emphasis on the 200 or so procedures actively examined by the subcommittees, would be reviewed by the commission/governing/advisory board members.

In all likelihood, it would probably take at least three years to complete this process the first time around, assuming no major barriers in obtaining the initial charge data. The technical staff would work continuously over this period. The subcommittees would probably need to meet at least four times a year to direct the staff and review their analyses. The more broad-based supervisory group would probably have to meet only twice a year.

Once the revised scale was completed, the staff could conduct follow-up cost studies, more detailed evaluation of procedures not explicitly analyzed during the initial period, and data collection needed to assess new procedures

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*See R. Berenson, "Group Decision-Making Methods," in Hadley et al., "Alternative Methods of Developing a Relative Value Scale," op. cit., for a more detailed discussion of issues pertinent to organizational structure.

or new methods of providing existing services. The staff could also be charged with the task of collecting data on earnings, hours of work, patient loads, etc. needed for the process of valuing the time of physicians in different specialties. (Data on salary levels, hours, and patient loads for patient care physicians practicing outside the fee-for-system, for example, would be among the information collected.) Subcommittees could probably meet less frequently than during the initial construction period, perhaps only twice a year.

The organizational structure for converting the relative cost scale into a relative value scale and then a fee schedule would obviously vary from insurer to insurer and should be largely controlled by insurers. As described above, there are many factors, goals, and objectives that an insurer might want to take into account in setting the fee schedule. Selecting goals is obviously a political process for public payers and a political/marketing process for private insurers. Who makes these decisions and how is essentially up to insurer.

Medicare and to some extent Medicaid programs would need legislative authority to set fee schedules. Such legislation could be vague or specific about particular goals and methods. Patient and provider representatives could be consultants to the process, or they could be given the opportunity to comment on proposed fees. HCFA could be required to review and modify fees at specified periods or at its discretion. All fees could be subject to change at each revision, or frequently performed services could be reviewed more frequently.

HCFA might establish a Physicians' Services Payment Office. This office, in conjunction with the Office of the Actuary, would be responsible for estimating expenditure levels under various assumptions about quantities of services provided and variations in fee levels for all or some services. It might also be responsible for collecting the data and conducting the analyses needed to estimate the impacts of proposed changes in fees, to evaluate the consequences of past changes, and to identify the needs for future changes. Final decisions would presumably be made at the executive level.

However these procedural issues are resolved, it is critical that Medicare and other insurers as well, set up systems to monitor the quantities of services provided, to assess changes in the quality of those services, and to evaluate beneficiaries' ease or difficulty in obtaining services at the fee schedule prices. This type of information would be essential to identifying both the impact of changes made in the fee schedule and the needs for future changes. Changes in political objectives and changes in budgetary constraints would also influence future modifications to the fee schedule.

Recalibration of the underlying relative cost and value scales would probably need to be done less frequently, perhaps every 5 years. Changes in costs due to changes in technologies and changes in the prices of inputs, especially the cost of time for physicians, nurses, and other labor would be incorporated into the scale revision process. New procedures could be incorporated into the scale as they become clinically acceptable, though reexamination of their costs, efficacy, etc., might occur more frequently than every 5 years. Various cost studies could be performed on an ongoing basis for selected procedures in order to build a larger and better data base for future considerations of changes in scale values.

E. CONCLUDING OBSERVATIONS

This paper has focused primarily on the issue of how to develop and construct a fee schedule. We outlined a three-step process which begins with the construction of a relative cost schedule. This schedule would show the relationship among physicians' services on the basis of their resource costs. To the extent possible, this step would focus on the technical process of providing physicians' services in order to develop a reasonably objective basis for the second step, converting the relative cost schedule into a relative value schedule. In this step, insurers would consider how services' benefits to patients, impact on other health care and nonhealth costs, and their own goals and objectives would cause a service's value to deviate from its cost. In other words, relative value is a broader and more subjective concept than relative cost. The third step is choosing one or more monetary conversion factors or multipliers that translate the relative value schedule into a fee schedule. A variety of monetary and policy objectives would presumably dominate this step.

Although there is considerable sentiment for tying fees more closely to costs, focusing only on costs as the basis for fees would divert insurers from the primary goal of a fee schedule--inducing providers to supply the quantity, quality, and degree of access to services they want for their beneficiaries. The ultimate test of how well a fee schedule is performing, whether the fees are right, should be in terms of the quantity, quality, and access the fee schedule buys for the amount the insurer spends.

The relationship between fees and costs is really a secondary issue. Insurers may be concerned that they are paying too much for some services because physicians are extracting monopoly profits on services for which patients' demand is insensitive to price. Insurers could test their suspicions simply by paying less for those services, and they should continue to pay less until either quantity, quality, or access decline to unacceptable levels.*

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*In the extreme example of monopoly profits, patients' demand for the service would be characterized by a vertical line intersecting an upward sloping supply function. Implicit in the supply function are the costs of

A key feature of the process we describe is that it relies heavily on judgments at every step, albeit supplemented by data and technical calculations. To the extent that the "right" fee schedule requires making tradeoffs between spending and quantity, quality, and access as well as among the latter three dimensions of physicians' services, then having to make judgments will be inevitable. Developing a formula that links fees to resource costs or some combination of measures of costs and other factors will remove the need to exercise judgments, but will probably also lead to a poorly performing fee schedule.

Political considerations would seem to require insurers, especially Medcare and Medicaid, to use cost information in order to justify changes in relative and/or absolute fees. Primarily for this reason, the process we have outlined begins with the development of a relative cost scale for physicians' services. Even so, we do not believe that major expenditures should be made to conduct large scale cost-finding studies, which would be very difficult to perform reliably. Rather, insurers' primary efforts should be directed toward developing data systems and methods for measuring quantity, quality and access and deciding whether the services physicians provide under the fee schedule are right or appropriate for their beneficiaries. Obviously, these tasks will not be easy, but pursuing them is more likely to contribute to a better system for paying for physicians' services than trying to identify the "true" cost of providing services.

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acceptable quality and access for that particular quantity of services. If the price being paid is above the price consistent with the intersection of the demand and supply functions, then lowering the price means moving down the vertical demand function. A lower price would thus affect only physicians' profits, and would have no impact on quantity, quality, or access until it fell below the price implied by the intersection of the two functions.

As a practical matter, it may not be desirable to implement a fee schedule that departs too radically from existing average charges. For one thing, major changes are likely to create substantial political opposition from physicians who would be financial losers and from patient groups who might fear disruptions in access and reductions in quality of care. For another, there is very little actual experience in constructing a relative value scale from other than charge data, converting that scale into a fee schedule for achieving specified objectives in addition to paying for services, and knowing precisely how physicians will respond.

In order to increase political acceptability and to minimize the costs of making mistakes in calculating fees, insurers may wish to constrain changes to be no more than 5 or 10 percent greater or smaller than existing average charges, for example.* If experience over the first year of the fee schedule did not highlight major problems or unexpected effects, then fees could be adjusted by another 5 to 10 percent on a periodic basis until the transition to the desired fee schedule was completed.

There are several questions which this paper has not addressed at all or barely touched on.** How should physicians' services be defined--by a detailed procedure coding terminology, a single, all-inclusive package of care

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*Chapter III below suggests that a fee schedule set equal to existing average reasonable charges would not cause major reallocations of Medicare payments among groups of physicians. Chapter II below documents how the Massachusetts Medicaid program implemented a partial fee schedule based on the Hsiao-Stason method.

**For discussions of some of these issues, see J. Hadley, "How Should Medicare Pay Physicians," Milbank Memorial Fund Quarterly/Health and Society (Spring 1984); J. Mitchell et al., Alternative Methods for Describing Services Performed and Billed, Health Economics Research, Inc. (Boston: 1984); and J. Holahan, "Physician Reimbursement," in J. Feder et al., National Health Insurance, Urban Institute Press (Washington: 1980).

per person, or something in between? How should physicians be compensated--by fee-for-service, salary, or capitation? How can market forces be incorporated into the regulatory process of setting fees? Under what circumstances should physicians be allowed to bill patients amounts in excess of the fee schedule? What is the role of cost sharing? Should so-called "cognitive" services receive special recognition? Each of these could by itself be the topic of a lengthy report. We would like to conclude this paper by briefly discussing three of them: fees for cognitive services, the role of the market, and the universality of a fee schedule.

The process we've outlined for constructing a fee schedule cannot resolve the cognitive procedural services debate.* But we believe that it suggests an alternative way of addressing the issue. From a social policy perspective, the main concern should be whether the possible disparity in reimbursement for cognitive and procedural services results in a mix of services which does not maximize patient welfare, i.e., too many procedures and not enough consultation and counseling. Unfortunately, the debate has centered primarily on the difference between fees and costs. The main argument seems to be that cognitive services are undervalued relative to procedural services because the implicit rate of return per unit of physician effort appears to be so much lower for cognitive services than for procedural services. The principal counterargument has been that these calculations do not properly take into account differences in skill, complexity, training, risk, etc., required to perform a procedural service relative to a cognitive service. From a more venal perspective, some physicians who provide cognitive services argue that

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*See for example, American Society of Internal Medicine, "Reimbursement for Physicians' Cognitive and Procedural Services: A White Paper," Washington, D.C., January 1981; "'Cognitive' Services Payment Increase Urged by Internists," American Medical News, October 16, 1981.

this disparity is unfair because their practices don't give them the opportunity to provide financially lucrative procedural services.

Taking the last point first, many other professions and occupations, such as ballet dancers, teachers, and gas station attendants, also have little or no opportunity to perform procedural services. But this fact would hardly justify paying more for ballet tickets, school budgets, or gasoline. Nor would paying more for these other services, in order to eliminate the apparent inequity in providers' payment per hour, make procedural services any less lucrative financially.

It may very well be that relative fees for cognitive and procedural services are out of line. But this judgment should be based on assessments of whether people are getting too many or too few of one or the other kinds of services. Again, making these assessments is not easy. They would require guaging whether people have trouble obtaining cognitive services, whether more cognitive services would improve outcomes (medically and/or fiscally), and whether too many procedural services of marginal or no benefit are being performed. Answers to these questions would signal how relative fees ought to be adjusted.

It should be remembered that even under the current Medicare payment system of customary, prevailing, reasonable reimbursement in which relative fees are supposedly out of line, the payments for the various categories of "visits" comprise by far the largest part of spending for physicians' services. In California in 1978, 17 visit codes accounted for 71.5 percent of Medicare's payments to a large sample of physicians.* For the most part, the visit categories in the CPT coding scheme reflects the various cognitive

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*Unpublished data, The Urban Insitute.

activities that physicians carry out. (Certain cognitive activities, such as telephone contacts, reading, etc., do not have codes for reimbursement purposes.) It would seem that at least some of the concern that patients do not receive an appropriate mix of services may go to the content of these visits and not to an underprovision of visits. If this is so, then the issue is not fees-for-visits compared to fees-for-procedures, but the absence of procedure codes that describe true cognitive activities.

Some may contend that physicians who provide procedural services are able to extract monopoly profits. If true, then fees for those services could and should be lowered. Also if true, the quantity and quality of procedural services provided should not fall until the fee drops below costs. But knowing the cost of procedural services in advance is not essential to decide to lower fees. Furthermore, the cost of cognitive services is absolutely irrelevant to the question of whether the fees for procedural services include monopoly profits.

Our approach may frustrate those who seek to determine where truth lies, just as economic realities frustrated theologians who sought the just price. Even with the right data, whoever is paying must decide what they want in order to set fees correctly. No objective truth exists for an issue like this. We encourage insurers to evaluate what they get for their payments rather than the relationship between payments and resource costs. Only this way can insurers ask the right questions and collect the right data for making good judgments.

To the extent that the modern fee schedule is no more than the ancient just price, will market forces make fee schedules anachronistic? Can regulatory fee schedules incorporate or take advantage of market-generated pressures? In the discussion of setting monetary multipliers, which convert the relative value schedule into a fee schedule, we described one possible way of meshing the market with fee schedules. Another approach, which is more in keeping with existing Medicare practice, is to permit physicians to bill patients for charges in excess of the fee schedule amount. Unlike the current system, Medicare could also permit rebates for charges below the fee schedule amount. In this way, patients would not be denied access to quality care where overall demand is high or physicians are in short supply. Nor would they have to pay more than the going rate where demand is "soft" and physicians are engaging in widespread fee discounting. Perhaps just as important, data on physicians' charges relative to fee schedule amounts would aid insurers in adjusting their fee schedules to keep pace with changing market conditions.

Strengthening patients' incentives to shop for physicians and be prudent purchasers would obviously enhance market forces. Several options are possible. One is to vary cost sharing obligations with the costliness of the provider. Another is to permit rebates to patients who obtain care from providers charging less than the fee schedule amount. For example, the patient might receive half of the difference directly from the insurer, with the insurer keeping the other half as program savings which could be applied toward future program expenses in order to lessen premium growth. In other words, rewarding patients for prudent purchasing will reinforce possible penalities for imprudent purchases.

A possible advantage of maintaining a dual system of fee schedule amounts and physicians' charges (above or below the fee schedule) is that average charges can serve as a continuous monitor of how close the fee schedule amount is to market conditions.* Unlike the system of physicians' submitting individual bids for an annual multiplier, charge data could be collected on an ongoing basis for all services. Not only are they more continuous than annual or periodic bidding, they also provide a mechanism for making adjustments to relative values and relative fees. Not all changes in market conditions will affect all services uniformly. Changes in a single or a few multipliers may not be able to detect such variations very precisely. Comparing relative and absolute charges to relative and absolute fee schedule amounts may provide better information about how to make changes.

Permitting physicians to bill patients amounts different from the fee schedule may be desirable for other reasons as well. In spite of the large number of procedures and the precision with which a procedure coding terminology defines them, there will inevitably be variation in the quality, convenience, and amenities people wish to purchase and providers are willing to provide. A uniform fee schedule which applies to all physicians and to all patients will discourage these variations. To the extent that high quality (as opposed to average quality) care is more expensive to provide, physicians will be reluctant to offer it. To the extent that patients want high quality care, they will have difficulty finding it. These types of conflicts are likely to arise where specialists and generalists provide the "same" service, and where more and less complicated cases of the "same" illness receive the "same" services.

The choice between equity and uniformity, on the one hand, and freedom of choice and diversity, on the other, is essentially political. Generally, the American way seems to favor the latter. If this in fact is the choice made, then separate means of insuring low income people adequate access to care of acceptable quality should also be an objective of the health care financing, payment, and delivery systems.

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*See Hadley (1984) for further discussion of this point.

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